

A
DISCOURSE
OF THE
Plurality of Worlds.

Written in FRENCH,
BY THE
Most ingenious Author
OF THE
Dialogues of the Dead.

AND
Translated into English
BY
Sir W. D. Knight.

DUBLIN,
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William Norman Book-binder to His Grace
the Duke of Ormond. 156

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T O

William Molyneux Esq;

THe following Discourse
I receiv'd from you in
French; I will not put such
a Construction as I might up-
on your sending me the En-
tertainments of a Man in the
Dark, or at best but in Moon-
light; I will only say, that
as they were his Diversion in
the Country, so I made them
A 2 mine.

mine. But when I consider'd his Chimerical Design (let us suppose it such) of enlarging the French Monarchy beyond the Moon, (for all Discoverys of the Subject belong to the Sovereign;) I grew jealous of the Attempt, and concern'd for the Honour of our Nation, we have hitherto outdone the French by the Progress of our Arms in *this World*, why should we fall short of them in our Discovery of *others*, when a *Chimera* will do the business. I have therefore rectify'd his French Telescope the best I could for the use of an English Eye, and recommend it first to yours as the best Judge, that

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that I know, of what may be perform'd by Opticks. I was once inclin'd (there being a Woman concern'd in the Discourse) to have address'd it to the Fair ones of that Sex; but when I consider'd, that they themselves make up the glorious number of those Planets that influence and adorn our Globe, and that 'tis the great Business of Mankind to discover their *Vortices*, I declin'd that thought, and concluded it a Work more proper for Men. I therefore continue my Address to you, wishing you good Success in all Discoveries of this kind, and for my own share, con-

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tent my self with the opportunity of discovering to our little World the Esteem I have for you.

Yours W. D.

TO

TO THE
BOOKSELLER.

I Here recommend to your Press the following Discourse, assuring you, that I think it worthy to appear abroad in the English Garb given it by the Ingenious Translator. The Dialogues of the Dead that proceeded from the same French Author were well received in the English Tongue; and how far the present Treatise surpasses those both for Ingenuity and pleasant Fancy, will be evident to all knowing Readers, particularly the Female Sex, that desire to become Philosophers, and acquainted in the World they live in, must needs take great

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satisfaction in these *Entertainments*,
which indeed were chiefly designed
for their *Diversion* and *Instruction*;
and therefore an ingenious *Marchi-*
oness is introduced as chiefly in-
gaged in these *Contemplations*;
which are deliver'd not with the se-
vere *Air* of *Philosophy*, but so inter-
sprersed with pleasant *Illustrations*,
and facetious instructive *Remarks*,
that certainly he that once sets up-
on them, will hardly lay the *Book*
aside till he has run quite through
them, the whole is so very charming.
How proper and apposite to the *Ori-*
ginal the present *Translation* is, will
appear to any one skill'd in both *Lan-*
guages that will compare them toge-
ther; I think indeed 'tis as natural
and agreeable as can be.

W. M.
THE

T H E

Authors Preface.

THe Case is almost the same with me as it was with *Cicero*, when he attempted to discourse of Philosophy in *Latine*, which till then had been only treated of in *Greek*. He tells us, that 'twas said his Work would be in vain; for the Lovers of Philosophy, who had taken pains in their inquiries into *Greek* Authors, would not care much for it in the *Latine*, as not being the Original; and those who affected not Philosophy, would esteem it alike either in *Latine* or *Greek*. To which he answers, that it would happen quite otherwise; that those who were not Philosophers would be invited to be so by the facility of reading *Latine* Authors; and those who were such already by their study of *Greek* Authors, would be well pleased to see how those things were treated of in *Latine*.

Cicero was in the right, the Excellency of his Genius, and the great Reputation he had already

The Author's Preface.

already acquir'd, did assure him of success in publishing that new sort of Work. But for me, I am very far from the like cause of confidence, though in an attempt much alike. My design is to treat of Philosophy in a manner not Philosophical, and in a Stile not too Stoical for the airy people of the world, nor too light for the learned. But if it be objected to me, as it was to *Cicero*, that such a Work will benefit neither the learned, who will learn nothing by it; nor the people of the world, who will not care to be taught by it, I shall not answer as he did; for it may happen that in seeking a medium, whereby Philosophy may be made agreeable to all, I may have found one that may render her agreeable to none, 'tis hard to keep a medium, and I believe I shall hardly ever give my self the like trouble a second time.

If this Book happen to be read, I advertise those who have already any knowledge in Natural Philosophy, that I pretend not to instruct but to divert them, by presenting them their solid knowledg in a more gay & delightful dress; and I advertise those who are strangers to these kind of Notions, that I believe I might instruct and divert them both together. The former will act contrary to my design if they expect any benefit, and the later if they look for any thing but diversion.

I shall

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I shall not amuse my self, to say, that I made choice of a piece of Philosophy the most capable of any to invite Curiosity. A man would think that we should make nothing more our interest then to know how the World that we inhabit is made, and whether there be other Worlds like it, and inhabited as it is. But after all, let them trouble their heads that will about that; I am well assur'd, that none will trouble themselves about it, to do me a kindness in reading my Book. Such as have thoughts to throw away, may throw them away upon such Subjects as this; but 'tis not indeed every one that is in a condition to bear so unprofitable an expence.

I have introduc'd into these Entertainments a Woman that is to be instructed, and who never heard speak of such things as these: I was of opinion that the Fiction might stand me in good stead, and might render the Work more capable of pleasing, and might encourage Ladys, by the example of a Woman, who having nothing at all of a supernatural Character, nor exceeding the bounds of a person wholly illiterate, yet understands well what is said to her, and digests the *Worlds* and *Vortices* in her head without confusion. Why should there be any Woman inferiour to this imaginary Marchioness,

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chioness, who only apprehends what she cannot dispense with, but must of necessity apprehend?

True it is, the Marchioness applies herself a little, but what is that applying herself? 'tis not a penetrating by force of Imagination a thing that is either obscure in itself, or obscurely explain'd; 'tis only a not reading without apprehending what is read, and forming an Idea of it that is infallibly clear. I require from the Ladys no more application for this System of Philosophy, than they would allow to the Romance of the *Princess of Cleves*, if they would follow the Intrigue well, and discover the whole Beauty of it. 'Tis true, the Idea's of this Book are less familiar to most Women, than those of the *Princess of Cleves*, but they are not more obscure; they need think but twice and hit right.

As I do not pretend to form a System in the Air, without any foundation; so I have made use of real Arguments of Natural Philosophy, and have made use of as much as was necessary; but it falls out well likewise in this Subject, that the Idea's of Natural Philosophy are pleasant in themselves, and at the same time that they content the Reason, they give the Imagination a prospect that delights it, as well as if it had been
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made exprefly for it. When I meet a piece that is not altogether of the fame Stuff, I fet it out with foreign Ornaments. 'Tis *Virgils* way in the *Georgicks*, where he improves the ground of his Subject, which was dry enough, by frequent digreffions which are often very delightful. *Ovid* does the fame in his *De Arte Amandi*, though his Subject be infinitely more agreeable than any thing that he could intermix. 'Tis certain, he thought it tedious to difcourfe ftill of the fame thing, though it were of Gallantry. For my own fhare, I, who had more need of the affiftance of digreffions than he, have been fparing enough of them, I have authoriz'd them by the natural liberty of Converfation, I ufe them only there where I believ'd it would be fatisfactory to find them, I have plac'd the moft of them in the beginning of the Work; becaufe then the Mind was not well fettled to the principal Idea's that I offer it. In fine, I have taken them from the Subject it felf, or very near it.

I have not imagin'd any thing of the Inhabitants of the Worlds, that is wholly fabulous, but have endeavour'd to fay all that might be reasonably thought of them, and the Fancies themfelves that I have added, have fomething of a real foundation: true & false are intermixt, but ftill well enough diftinguifh'd.

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guish'd. I do not at all undertake to justify a Composition so extravagant ; and 'tis that that is the most important concern of this Work, and of which I cannot render a just Account. The publik will teach me what I ought to believe of my Design.

I have no more to say in this Preface, but to one sort of people, and possibly the most difficult to be pleased ; not but that good Reasons may be given them, but because good Reasons will not satisfy them, unless they please. They are those scrupulous sort of people who think it dangerous in respect of Religion, to place Inhabitants any where but upon the Earth. I respect even the greatest nicety that any one can entertain in the matter of Religion, and I should have observ'd so much respect to Religion itself, as not to jostle it in publick, if I found it contrary to my Opinion. But, which may possibly surprise you, Religion is not at all concern'd in this System, where I people an infinity of Worlds ; 'tis only to disengage your self from a little error of imagination. When you are told that the *Moon* is inhabited, you presently represent to your self men made like us, and then, if you are a Divine, you are full of difficulties. The Posterity of *Adam* could not spread as far as the *Moon*, nor send Colonys to those Countrys, then the
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-*The Authors Preface.*

men of the *Moon* are not the Sons of *Adam*; this is the thing that will puzzle the Divines, that there should be men not descended from *Adam*. No more need be said of it, all the difficulties imaginable are reduc'd to this, and the terms that ought to be us'd in a longer explication, merit too much respect to be inserted in a Book so little serious as this. Possibly I might answer your Objection solidly enough, would I undertake it, but 'tis most certain I need not: it aims wholly at the Men of the Moon, but 'tis you that place them there, not I; the Inhabitants I place there are not Men at all. What are they then? Truly I never saw them, nor is it because I ever saw them that I speak of them: nor would I have you suspect it an Evasion to elude your Objection, when I say there are no men in the *Moon*. You will see your self that 'tis impossible there should be, according to my Idea of the infinite diversity in the works of Nature. This Idea reigns in the whole Book, and cannot be disputed by any Philosopher. Nor indeed do I believe I shall find this Objection started by any but such as may censure these Discourses without having read them. But ought I from hence to think my self secure? on the contrary I have reason to fear the Objection will be made many ways beside.

ADVERTISEMENT

Concerning the

ERRATA.

THere are but two considerable Errors that corrupt the Sense, the first, Page 6. line 20. read *rather then leave a vacuity, &c.* the other, pag. 41. l. 23. read *from the moment that we have found an interior motion in the parts of the Moon, or produced by foreign causes, &c.* The following Errors are but literal, and may be helped by the Pen; pag. 1. l. 19. *there* for *then*, p. 19. l. 29. dele *tle*, ib. l. 30. *lit* for *little*, p. 25. l. 35. dele *much*, p. 30. l. 22. *profer'd* for *prefer'd*. p. 31. l. 19. dele *that*, ib. l. 34. adde *my*, p. 40. l. 24. dele *that*, p. 48. l. 31. *Cicon* for *Ciron*.

I

A
DISCOURSE
OF THE
Plurality of Worlds.

SIR,
YOU desire an exact account from me, how I spent my time in the Country with the Marchioness *d: G.* but you little think that that exact Account will amount to a Book, and what is worse, a Book of Philosophy. You may possibly expect to hear of nothing but Feasting, Gaming and Hunting, instead of which you will find Planets, Worlds and Vortices; for we had little to do with any thing else. Happy it is that you are a Philosopher, and therefore will not so soon deride us as another; nay possibly you will be well satisfied, that I have drawn the Marchioness into the Faction. I always indeed esteem'd Youth and Beauty to be things of so great value, that I think we could not well make a more considerable purchase. Do not you think that if *Wisdom* her self had a design to address her self to mortals with success, she would do well to take upon her, as near as she could, the shape of the Marchioness? and above all, could she but there appear as pleasing in her Conversation, most certain it is, that all the world would make court to *Wisdom*. Do not expect Miracles in the Recital of my Entertainment with that Lady; for it will require such a Wit as hers to repeat what she said, in the same man-

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ner she exprest it. For my own part, I take her to be learned, because of that great facility I find in her of being so; wherein is she defective? Is it that she has not por'd much on Books? Alas, 'tis nothing; many have done so all their life long, to whom yet, if I durst, I would not allow the name of learned. As to the rest, Sir, I shall oblige you. I know, before I enter upon the particulars of the Conversation I had with the Marchioness, I ought to give you some description of the Castle, where that Lady retired to pass the Autumn, (Castles have been describ'd upon less occasion) but you will excuse me that. It may suffice, that at my arrival there, I found her alone, and was well pleased at it. The two first days nothing remarkable past, they were spent in inquiries of News from *Paris*, from whence I came; afterward followed the Entertainments whereof I am to give you an Account. I shall divide them into Evenings, because indeed it was only in the Evening that we entertain'd those Discourses.

The First Evening.

'T WAS then in the Evening, after Supper, that we took a walk into the Park; the Air was delicate and fresh, which made amends for the heat of the day. I find I am falling into a Description, and I cannot well avoid it, the Subject leads me naturally to it. The Moon was about an hour high, and her beams, which came to us through the branches of the trees, made a pleasing mixture of a lively white, with all that green which then appeared black; not one Cloud appear'd to rob us of, or obscure, the least Star; they were all of Gold, pure and bright, and the appearance was yet heighten'd by the azure ground, in which they were set. The prospect set me a musing,
and

and perhaps without the Marchioness I had long continued so, but the presence of so fair a Lady withdrew my Admiration from the Moon and Stars. Do not you find, said I to her, that the day it self is not so beautiful as a clear night? 'Tis true, said she, the beauty of the day is like a fair Beauty that sparkles more; but the beauty of the night is a black beauty, that has more of charm. You are very generous, said I, to allow that advantage to the black, who have so little of it in your self; yet 'tis true, that the day is the most beautiful thing in Nature, and the Heroines of Romances, who are the greatest Beauties we can imagine, are ever represented *fair*. That's no Beauty, says she, unless it charm; you must confess that the day never put you into so sweet a Contemplation, as you were now fallen into at the prospect of this so bright a night. I grant you that, said I; but yet so fair a Creature as you, would put me in a deeper contemplation, than all the dark beauties of the most glorious night. Were that true, said she, I should not be satisfied: I would have the day, since the fair are concern'd in it, to have the same effect. Why is it that Lovers, who are good Judges of what is charming, ever, in all their Songs and Elegys that I have met with, address themselves to the Night? 'Tis doubtless, said I; because it most obliges them. But, says she, it has likewise all their Complaints; the Day shares not at all in their Confidence: from whence should this proceed? Because, said I, 'tis certain it creates not that unexpressable sort of sadness and passion. In the Night all things seem in repose, we fancy the Stars more silent in their motion than the Sun, the objects of Heaven are more pleasing, and entertain the Eye with less trouble; and in fine, we are such fools that we can muse better on them; because we flatter ourselves that we are then the only persons in nature

that are so imploy'd. Possibly likewise there is too much uniformity in the prospect of the Day, 'tis all but one Sun, one blue Arch, but the prospect of the Stars confusedly set, and disposed at randon in a thousand different figures, indulges our Contemplation, and creates a certain pleasing disorder in our thoughts. I have ever found, says she, what you tell me; I love the Stars, and complain heartily of the Sun that robs us of them. Oh! cry'd I, I cannot forgive him when he takes from me the sight of so many Worlds. How, (says she, looking on me, and turning towards me) do you call all those Worlds? I ask your pardon, said I, you have brought me into my folly, and I as soon discovered it. Pray, says she, what folly is that? Faith, said I, I find my self necessitated to acknowledge it to you, and 'tis this; I have had a fancy that every Star may possibly be a World. I will not swear 'tis true, but that is my opinion, because I find pleasure in believing it: 'Tis an Idea that tickles, and has with delight taken possession of my thoughts; and truly, in my opinion, delight is not amiss even in Truth it self. Well, says she, since your Folly is so delightful, pray let me have a share in it, I'll believe what you please of the Stars, provided I find pleasure in it. Ah! Madam, said I, 'tis not a pleasure like that which you find in a Comedy of *Moliere*; 'tis a pleasure, I know not where, in the reason, and delights only the Mind. And pray, says she, do you think me incapable of pleasures that are only in the Reason; bring me acquainted with your Stars, and you shall presently see the contrary. No, said I, it shall never be laid to my charge, that in a Grove, at ten of clock at night, I entertain'd the most lovely person in the World with nothing but Philosophy, look out for such Philosophers elsewhere.

I defended my self in this manner for a time, but
was

forc'd to yield; at least I made her promise, that for my Reputation sake she would keep my secret. When I thus found my self so far engag'd that I could not retreat, and had a mind to speak, I knew not whence to begin my Discourse; for with such a person that knew nothing of Natural Philosophy, it was requisite to go far about to make her apprehend that the Earth might be a Planet, and every Star a World. So that I e'n told her again, it were much better to talk of trifles, as every reasonable person, were they in our place, would do. But at last, to give her a general Notion of Philosophy, I began with her thus. All Philosophy, said I, is grounded on these two things, the Curiosity of our Minds, and the Shortness of our Sight: For if you could see better than you do, you would discern whether those Stars are Worlds or not Worlds, and on the other hand, if you were less curious, you would not care two pence to know whether they were so or not: but we are willing to know more than we can see, and there's the difficulty. Again, if we could rightly discern what we see, we might be said to be so far knowing; but the mischief is, we see things otherways than they really are; so that true Philosophers spend their days in not believing what they see, and in studying to divine of what they see not, a condition, in my opinion, not much to be envied. From hence I frame an Idea to my self, that Nature is but a great shew, resembling that of an Opera; from the place where you are seated at an Opera, you see not the Theatre such as it really is; 'tis disposed to give a delightful prospect at a distance, and all the Wheels and Weights that cause the movements are not in view: nor do you much concern your self to know how all is perform'd. Some Machinist might possibly lurk in the Pit, who would beat his brains about a *Turn* that seem'd extraordinary, and would venture absolutely to unriddle the whole contrivance

trivance of it, and this Machinist you may well resemble to the Philosophers; but that which among Philosophers augments the difficulty is, that in the Machines which Nature offers to our view, the Cords are so wholly and entirely abscond, that it has been the study of many days to resolve, from whence proceed the motions of the Universe: For imagine with your self all those Sages at an Opera, those *Pythagorases Plato's, Aristotles*; and all that learned crew, that at this day make so great a noise in the World, that they were Spectators of the flight of *Phaeton*, born upon the Wings of the Wind, and that they could not discover the Cords, nor know any thing how the back part of the Theatre was disposed: One of them would say; *'Tis some occult quality that bears up Phaeton.* Another, *Phaeton is compos'd of certain Numbers that make him mount.* Another, *Phaeton has a certain natural Propensity to the top of the Theatre, he is not at rest unless he be there.* Another, *Phaeton is not made to fly, but he had rather fly than a vacuity in the top of the Theatre*, and a thousand other extravagancies, that I admire have not blasted the Reputation of Antiquity: at last comes *Descartes* and some other of later days, who say, *that Phaeton mounts, because he is drawn by Cords, and that a Weight more heavy than he descends.* So that 'tis no longer believ'd that a body moves, unless it be by impulse from another body, and as it were drawn by Cords; nor that it ascends or descends, but by some counterpoise or spring; and he that would see Nature such as really she is, ought to look behind the Theatre. By this Account, says the Marchioness, Philosophy is become very mechanique. So mechanique, said I, that I fear we shall e're long be asham'd of it. Some will have it, that the Universe is in great, that which a Watch is in little, and that all is wrought by regular movements that depend upon the disposal of the
several

several parts. Now confess the truth, have not you sometimes had Notions of the Universe more sublime than this? and have you not done it more honour than it deserv'd? I have met with some, who after knowing it esteem'd it less. And I, says the Marchioness, esteem it much more, since I find it resembled to a Watch. 'Tis a thing to me most surprizing, that the Order of Nature, so admirable as it is, should depend upon things so simple. I know not, said I, where you met with Notions so sound, but I assure you they are not common; We shall daily meet with people that have in their heads a false kind of Wonder involv'd in Clouds which they respect; they admire Nature only because they believe it a kind of Magick, where nothing is understood: and 'tis most certain, that whatsoever is once comprehended, is with them presently disrespected. But, Madam said I, I find you so well dispos'd to enter upon what I am about to discourse to you, that I think I need do no more than draw the Curtain, and shew you the World.

From this Earth where we are, that which we behold at the greatest distance, is that Blue Sky, that great Arch where the Stars are set like so many nailes, they are call'd *Fixed* because they seem not to have any other motion than that of Heaven which wheels them along with it from East to West. Between the Earth and that Extreamest Arch of the Heavens, are hung at different heights the *Sun*, *Moon* and five other Stars which are called Planets. *Mercury*, *Venus*, *Mars*, *Jupiter*, and *Saturn*. These Planets not being set in one and the same Heaven and having unequal motions, have different regards and Aspects one towards the other, whereas the fixed Stars have ever in respect of one another, the same Situation. The *Wain*, for example, which you see is form'd of those seven Stars, has ever been and ever shall be the same it is, but the Moon

is sometime nearer, sometime farther off from the Sun so it is like wise with the other Planets. Thus things appear'd to those antient Shepherds of *Chaldea*, whose great leasure gave them the first observations, which have been the foundation of *Astronomy*, for *Astronomy* was born in *Chaldea*, as *Geometry* was in *Ægypt*, where the Inundations of *Nile* confounding the bounds and limits of all their Fields, was the cause that every one invented just measures to lay out his own Field from his Neighbours. So that *Astronomy* derives it self from Idleness, and *Geometry* from Interest, and if we make the like inquiry into *Poetry*, we shall find it draws its Original from Love.

I am very well satisfy'd, said the Marchioness, that I have learn'd this Geneology of the Sciences and I find I must keep close to *Astronomy*, *Geometry* and *Poetry*, according to what you say, will require the one a more interested, and the other a more tender soul than mine is, but I have all the leasure that is requisite in *Astronomy*, and happy it is likewise that we are in the country, where we lead a kind of Pastoral life agreeable to that study. Do not deceive your self, Madam, said I, that's not the true pastoral life, to discourse of Planets and fixed Stars. Do you find that the People of *Astrea* pass their time that way? Oh! says she, that sort of Shepherd life is too dangerous: I rather fancy that of the *Chaldeans*; pray, if you please, begin and speak *Chaldee* to me. When that Order and Disposition of the Heavens, which you tell me of, is known, where's the Question? The Question is, said I, to find how all the parts of the Universe ought to be ranged; and that's it which the Learned call framing of a System. But before I explain to you the first System, you must take notice, if you please, that naturally we are all like that Fool of *Athens*, whom you have heard spoke of, who had a fancy that all the Ships in the Port of *Pireum* were his. 'Tis just

just so our folly to persuade our selves that all Nature was design'd for our use, and when we ask our Philosophers, to what end is all that prodigious number of fixed Stars, when a few would suffice to perform the office of all? they'l answer jejunely, that they are to delight the Eye. Upon this principle it was believ'd, that the Earth rests quiet in the center of the Universe, while all the celestial bodies, which were made for it, take the pains to roll about and inlighten it. 'Twas then next above the the Earth that they plac'd the *Moon*, above the *Moon Mercury*; next *Venus*, the *Sun*, *Mars*, *Jupiter* and *Saturn*, and above all these the Orb of the fixed Stars. The Earth was seated just in the middle of these Circles describ'd by the Planets, and the greater those Circles were, the more distant they were from the Earth, and consequently the most distant Planets imployed more time in performing their Course, which is in effect true. But I know not, said the Marchioness, interrupting me, why you should not approve of that Order of the Universe, to me it seems as decent as intelligible; and for my own share, I declare I am well satisfied with it. I can boast, said I, that I have much qualify'd that whole System; for should I have represented it to you, such as it was at first fram'd by *Ptolomy* the Author, it would have astonish'd you. The motions of the Planets being not so regular, but that they went sometime faster, sometime slower, sometime to one side, sometime to another, sometime farther off, sometime near the Earth; the Ancients imagin'd a strange Labyrinth of Circles to salve those extravagant Appearances. So great was the intricacy of those Circles, that then when men knew no better, it was said by a King of *Arragon*, a great Mathematician, but something irreligious, That if he had been of God Almighty's Council when he made the World, he would have

have advised him better. 'Twas the expression of a Libertine; but pleasant enough, that at that time the great confusion of that System was the occasion of a sin. The Advice the King would have given was doubtless the suppressing of all those Circles that had caused so much intricacy in the celestial motions; and 'tis most certain, he meant the same likewise of those three superfluous Heavens that are plac'd beyond the fixed Stars. The Philosophers, to explicate one sort of motion of the celestial bodies, fram'd, beyond the utmost Heaven that we see, a Heaven of Crystal, which gave the first impulse of motion to the inferiour Orbs. If they discover'd any thing of another motion, they had presently another Crystalline Heaven ready at hand; for Heavens of Crystal in those days cost them little or nothing. But why, said the Marchioness, did they still make them of Crystal? Would not some other material have done as well? By no means, said I, it was requisite they should be transparent, to give way to the passage of Light, and it was absolutely necessary they should be solid; for *Aristotle* had found that Solidity was a thing affix'd to the Nobility of their Nature; and when he once said it, it was no longer to be doubted. But since Comets have been observed to rise higher than heretofore it was believed, it was fear'd that in their passage they might hazard the cracking of those Crystalline Heavens, and break the World about our ears: therefore it has been thought more convenient to make them of a more fluid matter. In fine, it is now a thing undoubted by the Observations of later Ages, that *Venus* and *Mercury* move about the *Sun*, and not about the Earth, and that the ancient System is not at all tenable. But I am now going to propose another to you, which will satisfy in all points, and save the King of *Arragon* the trouble of his Advice; it is of
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a most charming simplicity, which alone ought to give it the preference. I see, says the Marchioness, that Philosophy is a kind of Chaffering, where they that ask cheapest shall have your Work before another. 'Tis very true, said I, and that's the only way to trace out the Works of Nature; she's hugely provident, and whatever she can do in such a way as may cost her little or nothing, to be sure she will do it that way, rather than another; yet this Providence agrees well with a surprizing Magnificence that is illustrious in all her actions; that is, there is Magnificence in the Design, and a sparing Providence in the Execution. There is nothing more commendable, than a great Design managed with a little Charge; but we frame our Idea's wholly to the contrary, and place the Frugality of Nature in the Design, and the Magnificence in the Execution; we represent her carrying on a small inconsiderable Design, with ten times more Charge than needs, which is ridiculous. I shall be very well pleas'd, said the Marchioness, that the System you tell me of may be a perfect imitation of Nature; for that Parcimony will be much in favour of my imagination, which will have less trouble in comprehending what you tell me. You will there, said I, meet with no unnecessary difficulties, represent only to your self a certain *German* call'd *Copernicus*, who pull'd down all those different Circles and solid Heavens that were set up by Antiquity; he destroys the one, and breaks the other in pieces, and, possess'd with a noble Astronomical fury, he takes the Earth and throws it out of the center of the World, where it had long been fixt, and in the place of it puts the *Sun*, as much more deserving of that Honour; the Planets turn no more about the Earth, nor circumscribe her in their Circles; if they enlighten us, 'tis in a manner only by chance, and as we meet them on the road. All turns now about the *Sun*, even the
Earth

Earth it self, and to chastise her for her long idle repose, *Copernicus* charges her as near as he can with all those motions she before impos'd upon the Planets and Heavens. And in fine, of all that bright Equipage which attended and surrounded this little spot of Earth, no more remains but the *Moon* which still rolls about her. Hold a little, says the Marchioness, you are fallen into an Enthusiasm, and explain things in so pompous a manner, that I know not whether I rightly understand them. The *Sun*, you say, is in the Center of the World, and there remains immoveable; pray what follows next? 'Tis *Mercury*, says I, he turns about the *Sun*, so that the *Sun* is the Center of that Circle describ'd by *Mercury*. Above *Mercury* is *Venus*, which likewise turns about the *Sun*. Next follows the Earth, which being above *Mercury* and *Venus*, describes about the *Sun* a Circle greater than theirs. Then follow *Mars*, *Jupiter* and *Saturn* in the order I have told you, and you may perceive that *Saturn* ought to describe about the *Sun* the greatest Circle of all, and he likewise is longer than any other Planet in performing his Revolution. And what, says she, becomes of the *Moon*? you forget her. I'll meet her again, said I, easy enough; she keeps close to the *Earth*, and forsakes her not, but as the *Earth* advances daily in the Circle which she describes about the *Sun*; the *Moon* follows in her daily course about the *Earth*; so that if the *Moon* turn about the *Sun*, 'tis only because she will not forsake the *Earth*.

I understand you, says she, and I love the *Moon* that stays with us, when all the rest of the Planets have forsaken us; but you must confess that if your *German* could have rob'd us of her too, he would have done it; for I find he had no great kindness for the *Earth*. I know, says I, his design was to abate the Vanity of men who had thrust themselves
into

into the chief place of the Universe, and I am very well pleased to see the Earth now in the common road of the other Planets. Very well, says she, do you think the Vanity of men extends to *Astronomy*? or that I am more troubled because I understand that the Earth moves about the Sun? I profess, I do not at all esteem my self less. Madam, said I, I know well that no man will be so scrupulous of taking place in the Universe, as in a Chamber, nor will the precedency of two Planets be a matter of so great dispute as that of two Ambassadors. But in the mean time, the same inclination that moves a man to affect the chief place in a Ceremony, moves a Philosopher in his System to set himself, if he can in the Center of the World. He is well enough pleas'd that all should be done for him, he supposes the Principle that flatters him, and his Heart cannot forbear a self-interest, though in a matter of meer speculation. Oh! says she, this is a downright scandal that you raise against all mankind. At this rate then, since *Copernicus's* System is so humble, no man would ever admit of it. Truly, said I, *Copernicus* himself was very diffident of the success of his Opinion, and was long before he would publish it; at last he was persuaded, but the day that the first printed Copy of his Book was brought to him, do you know what he did? Faith he died; He had no mind to withstand all the Contradiction he knew it would meet with, and therefore wisely withdrew. But hark you, said the Marchioness, we must do justice to all the World: it is certainly very difficult to believe that we turn; for I cannot see that we change place, and we find our selves in the morning where we lay down at night. I find, methinks, in your face that you are going to tell me, that as the whole body of the Earth moves ——— Most true, said I, interrupting her, 'tis the same thing as if you slept upon the River in a Boat, you would find

find your self at waking in the same place and same situation in respect of the parts of the Boat. Allow'd, says she, but here's the difference, I should find at waking the Banks of the River chang'd, and from thence I should find that my Boat had chang'd place. But 'tis not so with the Earth, I find all things there just as I left them. No, no, Madam, said I, the Banks change also. You know that beyond all those Circles of the Planets are the fixed Stars, those are our Banks. I am upon the Earth, and the Earth describes a great Circle about the Sun. I look towards the center of that Circle, and see there the Sun: if the Stars were then to be seen, in looking on in a straight line beyond the Sun, I must needs see which of the fixed Stars answer'd to him; but I easily see in the night, which of the Stars answer'd to him in the day, which is exactly the same thing. If the Earth did not change place in the Circle where she is, I should see the Sun every day answering the same fixed Stars; but since she changes place, I must needs find him answer to others. There's the Bank that changes every day, and as the Earth performs her Circle in one year, I see the Sun in the space of one year answer a whole Circle of fixed Stars. That Circle is call'd the *Zodiac*; if you please, Ile draw you a Figure here in the dust. No, no, says she, I shall do well enough without it: besides it will give my Paik an Air of Philosophy, which I have no mind to. Have not I heard of a Philosopher that was cast by shipwrack upon an unknown Island, and finding a trace of Mathematical Figures upon the Strand, cryed out, *Courage, Companions, the Island is inhabited, see here the footsteps of men.* You know well, it is not for my credit to make such steps here, nor that any one should see them.

It were more proper indeed, said I, that no footsteps should be seen here but those of Lovers, that is

to say, your Name and Characters engraven upon the Barks of Trees by the hands of your Adorers. Pray, says she, leave off your Adorers, and let us talk of the Sun; I understand well how we imagine he describes the Circle, that we describe our selves: but that Course is not performed but in a year, and that which he makes every day over our heads, how is that perform'd? Have you observ'd, said I, that a Bowl running upon the earth has two motions? it moves towards the end of its course where it is directed, and at the same time turns it self many times about, so that the upper parts descend and those below ascend; the Earth does the like: While she advances in her annual Circle about the Sun, she turns about her self in four and twenty hours; so that in four and twenty hours every part of the Earth loses and recovers the Sun; and as we turn toward that side where the Sun is, he seems to rise, and as we begin to remove from him, he seems to descend. This, says she, is pleasant enough, the Earth takes all upon it self, and the Sun does nothing, and when the Moon and the other Planets, and the fixed Stars roll about our heads, is that likewise imagination? Nothing else, says I, but pure imagination, from the same cause: the Planets only make their revolutions about the Sun in unequal times, according to their unequal distances, and that which to day we see answering to a certain point of the Zodiack, or of that Circle of fixed Stars, to morrow we shall find answering to another point, both because it has advanc'd in its own Circle, and we have advanc'd likewise in ours: 'tis that that puts us in different points of sight in respect of them, and makes us seem to be in their course of extravagance, of which it is not necessary to tell you: it may suffice you to know, that all that seems irregular in the Planets, proceeds only from the different manner of our meeting them in our motion,

motion, when really they are all extremely regular. I agree, said the Marchioness, that they may be so; but I would willingly that their Regularity should be less troublesome to the Earth. She is not easily movable, and for a great lump so weighty as she is, it will require a good proportion of Agility. But, says I, would you rather that the Sun and all the Stars, which are vastly greater Bodies, should make every day in four and twenty hours an immense circuit of an infinite number of Leagues about the Earth? for so they must needs do, unless the Earth move about her self in four and twenty hours.

Oh, says she, the Sun and Stars consist of Fire, their motion costs them little; but the Earth seems not easily managable. And would you believe, said I, if you did not know it by experience, that a great Ship mounted with an hundred and fifty pieces of Artillery, man'd with above three thousand men, and well laden with Merchandise, would be a thing easily portable? in the mean time a little puff of Wind suffices to drive it upon the Water; because the Water being liquid, is easily divided, and makes no resistance to the motion of the Ship; so the Earth, though an unweildy mass, is easily carried through the celestial matter, which is ten thousand times more fluid than Water, and fills all that vast space where the Planets swim. And where is it necessary that the Earth should be riveted to resist the motion of that Celestial matter? 'Tis as if a little Boul of Wood could be able not to follow the Current of a River.

But, says she again, how is the Earth with all its weight supported in your Celestial matter, which being so fluid must needs be very light? That's not to be allow'd, said I, that what is more fluid is more light. What do you say to your great Vessel; which with all its weight must needs be lighter than the Water, because it swims upon it. He say no more
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to you, says she, as though angry, as long as you have that great Vessel. But can you assure me that there's nothing to be fear'd upon such a Shuttlecock or Whirligigg, as you make the Earth? Well, says I, let us carry the Earth upon four Elephants, as the *Indians* do. See, says she, another kind of System; yet truly, I like those people that provide for their security, and lay a good foundation; whereas we *Copernicans* in my opinion are rash enough to attempt to swim at a venture in that Celestial matter. He hold a Wager, that if the *Indians* knew the Earth were in the least danger in the world of being mov'd, they'd double their Elephants 'Twill be worth the while, said I, laughing at her Fancy, never spare an Elephant to sleep in security, and if you have occasion for them this night, we'l put as many in our System as you please, and afterward take them out again by little and little, as you begin to be more and more assured. Seriously, says she, I believe from this time forward I shall not much need them; for I find my self couragious enough to turn. You shall presently, says I, go yet farther, and have delightful Ideas of this System. Sometimes, for example, I fancy with my self that I hang in the Air, and continue there without motion while the Earth turns under me four and twenty hours, and I see pass under me all these different appearances, some white, some black, some swarthy, others tawny, now Hats, then Turbants, some Heads with Hair, others bald, by and by Towns with Steeples, then Towns with long Spires and Crescents, next Towns with Towers of Porcelain, then a large Country that has nothing but Cabins, here a vast Sea, there a frightful Desert, and in fine, all the infinite variety upon the face of the Earth.

Truly, says she, it would be four and twenty hours well spent to see all this; so that in the same place
C where

where we are, I do not mean in this Park, but in the same place in the Air, other people are continually passing, and take our place, and in four and twenty hours we return here again.

Copernicus himself, says I, could not apprehend it better; by and by you'll see some English men pass this way debating some point of Policy, but not so airily as we do our Philosophy; then comes a great Sea, where you'll see a Ship that possibly will not be so much at ease as we are; afterward appear the *Irroquoi's* eating alive some Prisoner of War, who seems not much to heed it; then Women of the Land of *Fesso*, who spend their whole time in preparing Food for their Husbands, and painting their Lips and Eyebrows blue, to please the most villanous sort of men in the world; next *Tartars* going in Pilgrimage with great Devotion to that great Priest, who lives always shut up in a Hole where he has no Light, but a Lamp, by which they adore him; then come the fair *Circassians*, who make no scruple of granting all at first sight, only what they think belongs essentially to their Husbands. Then the little *Tartars*, who steal Women for the *Turks* and *Persians*; and lastly, we who possibly shall yet find other extravagant Inventions.

'Tis pleasant enough, says the Marchioness, to imagin all this you tell me; but if I saw it all from an height, I should wish to have the liberty to hasten or stop the motion of the Earth, according as the Objects pleas'd or displeas'd me; and, I assure you, I should presently turn away those that trouble their Heads with Policy, or eat their Enemies; but for some others I should have a curiosity; particularly for those fair *Circassians*, they have a custom which methinks is very particular. 'Tis, says I, because they are so fair that their Husbands find in their favours a superfluity, which they allow to strangers.

Then

Then the Women of this Country, says the Marchioness, are very ugly, compared with them, for the Husbands here give no liberty at all. That's the reason, says I, they take more, whereas———
Hold your peace, says she, I'll talk no more follies; besides I have a serious difficulty come in my head, If the Earth turn, we change Air every moment, and breath that of another Contry. Not at all, Madam, says I, the Air which surrounds the Earth extends but to a certain height, it may be twenty leagues or so, and it follows and turns along with us. You have a thousand times seen the Work of a Silkworm, or those Cods of Silk which those little Animals work with so much Art for their own Prison, they are of a close wrought Silk, but are covered with a certain Down very light and loose. Just so the Earth, which is solid enough, is cover'd from the surface about twenty leagues high at most, with a kind of Down, which is the Air; This and all the other Cod of the Silkworm turns at the same time. Beyond the Air is the Celestial matter incomparably more pure, more subtil, and likewise more in motion than it. You give me, said the Marchioness, Idea's of the Earth contemptible enough; is it then upon this shell of a Silkworm that we labour and toil, and fight, and make such a noise on all hands as we do? 'Tis even so, said I, and in the mean time Nature that takes no notice of those little particular motions, carries us altogether with one general movement, and sports her self with the lit-Ball. To me, says she, it seems something ridiculous to be seated upon a thing that turns, and torment ones self so much; but the mischief is, we are not fully assur'd that we turn; for to tell you truth, notwithstanding all those precautions you have us'd, that a man should not perceive the motion of the Earth, I am still very doubtful. Is it possible it

should not be discover'd by some little mark or other? The most natural motions, said I, and the most ordinary, are those which are least perceiv'd, and this is true even in Morality it self. The motion of Self-love is so natural to us, that most commonly we are not at all sensible of it, and think that we are acted by some other principle. Ah! says she, when there's a Question in Natural Philosophy, you begin to moralize, and that's call'd Bantring. Let us now retire, for this is enough for once. To morrow we'll come here again, you with your Systems, and I with my Ignorance.

In our return to the Castle, I told her, to carry on the business of Systems, that there was a third sort invented by *Tycho Brahe*, who being absolutely of opinion that the Earth was immovable, plac'd it in the Center of the World, and made the Sun turn about it, and all the Planets about the Sun; because since the new Discoveries, there was no way left to make the Planets turn about the Earth. But the Marchioness, who is of a quick and lively Judgment, was of opinion that it was too much Affectation to exempt the Earth from turning about the Sun, since so many other great Bodies could not be exempted; That it was not so proper for the Sun to turn about the Earth, since all the Planets turn'd about him. That that System was at best only propet to maintain the Immobility of the Earth, when any one had a mind to maintain it, but not at all to persuade it. In fine, we resolv'd to hold to that of *Copernicus*, which is more uniform, and more delightful, and has no mixture of prejudice. In effect the Simplicity of it persuades, and the Boldness delights.

T H E

Second Evening.

NEXT Morning, as soon as the Marchioness could be seen, I sent to know how she did, and to ask her if she could sleep well *turning*? She sent me word, that she was so well accustomed to that sort of motion of the Earth, that she pass'd the night as quietly as *Copernicus* himself could have done. Soon after she had Company came to her, who, according to the troublesome Custome in the Country, stay'd with her till Evening; and they were obliging in that too; for by the Custom in the Country they had a right to continue their Visits till next morning if they pleas'd; but they were so honest as to be gone. So that the Marchioness and I found our selves at liberty in the Evening. We took our Walk again into the Park, and our Conversation fail'd not to return presently to our Systems. She had apprehended them so well, that she disdain'd to discourse of them a second time, but would needs have me lead her to some new matter.

Well then, said I, since the Sun; that is now immovable, is no more a Planet, and that the Earth, that moves about him, has begun to be one, you will not be so surpriz'd to hear that the *Moon* is an *Earth* like this, and that apparently she is inhabited. Truly, says she, I never yet heard speak of the Moon's being inhabited, but only as a Folly and a Vision. Possibly 'tis such, said I. I do not ingage in things of that nature, but as men ingage in a Civil War, where the incertainty of the event makes them still hold intelligence with the opposite Party, and maintain

Intrigue with the very Enemy. For my part, though I should see the Moon inhabited, yet I would still live civilly with those that do not believe it, and I preserve my self in such a condition, that I may with Honour subscribe to their Opinion, if it prevail. But in the mean while, till they get some considerable advantages over us, see what it is has drawn me to side with the Inhabitants of the Moon.

Let us suppose that there was never any Commerce between *Paris* and *St. Denis* (a Town about three miles from *Paris*) and that a Burgeſs of *Paris*, who never stirr'd out of the Town, should from the top of *Noſtre Dame* see *Saint Denis* at a distance, the question is put him, whether he believes that *Saint Denis* is inhabited as *Paris* is or not, he'll confidently say no; for, says he, I see plainly the Inhabitants of *Paris*, but those of *Saint Denis* I do not see at all, nor ever heard speak of them. Some ſtander-by may tell him, that 'tis true indeed that from the top of *Noſtre Dame* the Inhabitants of *Saint Denis* are not ſeen, but that 'tis the distance is the cause, that all that can be ſeen of *Saint Denis* is very like *Paris*, that *Saint Denis* has Steeples, and Houſes and Walls, and poſſibly may likewise reſemble *Paris* in being inhabited, all this will not prevail with my honeſt Burgeſs, he's ſtill obſtinate that *Saint Denis* cannot be inhabited, becauſe he ſees not a man in it. Our *Saint Denis* is the Moon, and every one of us is juſt ſuch a Burgeſs of *Paris* that never ſtirr'd out of the Town.

Oh! ſaid the Marchioneſs, you do us wrong, we are not ſo dull as your Burgeſs; he that ſees *Saint Denis* wholly made like *Paris*, muſt needs have loſt his Reaſon, not to believe that 'tis inhabited; but the Moon is not at all made like the Earth. Have a care, Madam, ſaid I, for if I prove that the Moon muſt reſemble the Earth, you are then downright oblig'd

oblig'd to believe that the *Moon* is inhabited. I acknowledge, says she, there will be no way to avoid it; and I observe in your looks an air of confidence that makes me half afraid. The two motions of the *Earth*, of which I shall never make any doubt, make me timorous in all the rest; but however, is it possible that the *Earth* should be luminous as the *Moon* is? for that must be to make up the resemblance. Alas, Madam, said I, to be luminous is not so a great matter as you imagine; there is only the *Sun* in which that quality is considerable; he is luminous in himself, by virtue of a nature peculiar to him, but the Planets give' no Light, but as they are enlighten'd by him. He sends his Light to the *Moon*, she returns it to us, and it must needs be likewise, that the *Earth* sends the Light of the *Sun* to the *Moon*; for 'tis no farther from the *Earth* to the *Moon*, than from the *Moon* to the *Earth*.

But, says the Marchioness, is the *Earth* as proper as the *Moon* to reflect the Light of the *Sun*? I observe, said I, that you have still a good thought for the *Moon*, which you cannot part with. The Light is composed of little Balls, that rebound from any thing that is solid, whereas they pass in a straight line through any thing that opens to them, as the Air, or Glass. So that hence it is that the *Moon* gives us Light, because she is a hard solid body that reflects those little Balls upon us. Now I believe you will not at all contest the solidity of the *Earth*. Admire then what it is to be advantagiously plac'd. The *Moon* being so far distant from us, we only behold it as a luminous body, and know not that 'tis a great mass like the *Earth*. On the contrary, because the *Earth* has the ill luck to be seen by us near at hand, she appears to us a great mass fit for nothing but to feed Cattel, and cannot discern that she is luminous, because we cannot set our selves at distance enough

from her. Just so, said she, we are dazl'd with the lustre of Conditions more elevated than our own, and never discern that in the bottom they are extremely alike.

'Tis even so, said I we would judge of all, but are still ill placed to take our view; in judging of our selves we are too near, and in judging of others too far off. The middle place between the *Moon* and the *Earth* is the best to take a right prospect of both; and better it would be, to be simply a Spectator of the *World* than an Inhabitant. I shall never be comforted, says she, for the Injustice we do the *Earth*, and our too much partiality to the *Moon*, unless you assure me that the people of the *Moon* have no more knowledge of their Advantages than we have of ours, and that they take our *Earth* for a *Star*, without knowing that their own Habitation is so likewise. I'll warrant you for that, said I, we appear to them to perform our function of a *Star* regularly enough: 'tis true they do not see us describe a Circle about them; but 'tis no matter, the thing is this; The half of the *Moon* which was turn'd towards us at the beginning of the *World*, has continued so ever since, she still shews the same Eyes, the same Mouth, and all the rest of the Face, which those Spots we discern in her, frame in our Imagination; if we saw the other half, other kind of Spots, in different posture, would doubtless create in our Imagination other kind of Figures. 'Tis not that the *Moon* does not turn about her self, 'tis certain she turns in just so much time as she turns about the *Earth*, that is, in a month. But when she has made one part of that turn about her self, and that she ought to hide, for example, one Cheek of that pretended Face from us, and appear some other thing, she makes the like part of her Circle about the *Earth*, and putting her self in a new point of sight, shews us
still

still the same Cheek. So that the *Moon*, that in respect of the *Sun* and other *Stars*, turns about her self, in respect of us turns not all. She sees them all rise and set in the space of fifteen days, but our Earth she sees daily hanging in the same place of Heaven. This seeming Immobility agrees not well with a body which ought to pass for a *Star*; but 'tis true likewise that she her self is not perfect. The *Moon* has a certain wavering motion (*motus libratorius*) which is the cause that a little corner of her Face is sometimes hid, and a little corner of the opposite side appears. Now I'll undertake, that she imputes that wavering to us, and imagines that we have a movement to and fro in the Heavens like a *Pendulum*.

All these Planets, says the Marchioness, I find are made like us, who are still charging others with what is in our selves; the Earth says, 'Tis not I that turn, 'tis the *Sun*: The Moon says, 'Tis not I that waver, 'tis the *Earth*: there's faults enough every where. I would not advise you, said I, to attempt a Reformation: 'Tis better that you fully convince your self of the perfect resemblance of the *Earth* and *Moon*. Represent to your self those two great Boulds hanging in the Heavens. You know that the *Sun* always enlightens one half of a Spherical body, and that the other half is in the Shadow. Then the *Sun* daily enlightens one half both of the *Earth* and the *Moon*, viz. in one half 'tis day, in the other night. Observe moreover, that as a Ball loses its force when reverberated from a Wall, so likewise the Light grows weak when reflected from another body. That pale Light which we receive from the *Moon*, is the very Light of the *Sun*, but it cannot come to us but by Reflection. It must therefore lose much much of the force and vivacity it had when it fell directly upon the *Moon*. So that glittering Light which we receive directly

directly from the *Sun*, and is reflected from the *Earth* to the *Moon*, must needs be but a pale Light when it reaches thither. So that which appears to us luminous in the *Moon*, and which enlightens us in our nights, is the parts of the *Moon* where it is then day, and the parts of the *Earth* where it is day being turn'd towards the parts of the *Moon* where it is night, enlightens them likewise; all depends upon the manner of the *Moon* and *Earths* regarding one another. In the first days of a month, when the *Moon* is not seen, she is then between the *Sun* and us, and moves by day along with the *Sun*. It must needs be, that the half of her where it is day is turn'd toward the *Sun*, and her other half that is benighted is turn'd towards us. We do not look to see that half that has no Light to shew it self, but that half of the *Moon* that is benighted being turn'd toward the half of the *Earth* where it is day, sees us without being seen, and sees us in the same figure as we see the *full Moon*. 'Tis then, with the Inhabitants of the *Moon*, *full Earth*, if I may be permitted the expression. Afterward the *Moon*, which advances in her monthly Circle, disengages from under the *Sun*, and begins to shew us a little corner of her *inlighten'd half*; and that's the *Crescent*: and then likewise the parts of the *Moon* that are benighted begin not to see all the half of the *Earth* that is inlighten'd, and we are running from them.

'Tis enough, said the Marchioness, briskly, I shall know all the rest when I please, I need but think on it a moment and walk the *Moon* about her monthly Circuit. I see in general that in the *Moon* they have a month reverse to ours, and I'll hold a Wager, that when 'tis *full Moon* with us, 'tis the inlighten'd half of the *Moon* turn'd towards the obscure part of the *Earth*, and 'tis then they see us not at all, and count it *New Earth*. I would not be re-

reproch'd to have requir'd so minute an explication of a thing so easie. But pray how happen the *Eclipses*? That, said I, belongs to you to judge. When 'tis *New Moon*, that she is between us and the *Sun*, and that all her obscure part is turn'd towards us in our day time; you see well that the Shadow of that *obscure half* is cast towards us. If the *Moon* be directly under the *Sun*, that *Shadow* hides him from us, and at the same time darkens all that luminous part of the *Earth* that was seen by the *obscure* part of the *Moon*. See there an *Eclipse* of the *Sun* for us in our day time, and an *Eclipse* of the *Earth* for the *Moon* in their night. When the *Moon* is full the *Earth* is between her and the *Sun*, and all the obscure half of the *Earth* is turn'd towards the enlighten'd half of the *Moon*; The Shadow of the *Earth* is then cast towards the *Moon*, and if it fall upon the body of the *Moon*, it darkens that luminous half which we saw, and hides the *Sun* from that luminous half in the *Moon* where it was day. See there an *Eclipse* of the *Moon* for us in our night, and an *Eclipse* of the *Sun* for the *Moon* in her day. The reason why *Eclipses* do not happen every time that the *Moon* is between the *Sun* and the *Earth*, or the *Earth* between the *Sun* and the *Moon*, is because those three bodies are not always in a right line one to the other, and by consequence that Body that ought to make the *Eclipse* casts its Shadow a little on one side of that which should be obscured by it.

I am very much astonish'd, said the Marchioness, that there should be so little Mystery in *Eclipses*, and yet all the World so ignorant of their Causes. Ah! said I, there are enough in the World, that as they go to work, will never understand them. The *East Indians* believe that when the *Sun* and *Moon* are in *Eclipse*, it is a certain *Demon* that with his black Paws stretch'd out towards those Stars, endeavours
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to lay hold on them, and you shall see at that time the Rivers cover'd with Heads of *Indians*, who plunge themselves up to the neck in Water, as the most devout posture, in their opinion, to prevail with the *Sun* and *Moon* to protect them from the Paws of the *Demon*. The *Americans* think the *Sun* and *Moon* are angry with them when they are eclips'd, and God knows what they do not, to reconcile themselves with them. The *Greeks*, who were so refin'd, did they not believe a long while that the *Moon* was then enchanted, and that she was brought down from Heaven by *Magicians*, to cast a malignant froth upon Herbs? And we our selves were we not very fairly frighten'd at an Eclipse of the *Sun* not above thirty years since? When an infinite number of people shut themselves up in Caves, and the Philosophers that imploy'd their Pens to incourage us, writ in vain.

Truly, says she, all this is very much to the shame of Men; there ought to be a general Edict prohibiting, That none should ever speak of an *Eclipse*, for fear of preserving the memory of those Follies that have been said and done upon that account. Then 'twill be likewise necessary, said I, by the same Edict to abolish the memory of all things, and forbid ever speaking of any thing; for I know nothing in the World that is not a monument of the Folly of mankind.

Pray tell me one thing, says the Marchioness, are they as much afraid of an *Eclipse* in the *Moon* as we are here? It would seem to me a meer Burlesque, that the *Indians* of that Country should plunge themselves into the Water as ours do, and that the *Americans* there should think our *Earth* angry with them, or the *Greeks* imagine that we are enchanted and go down to spoil their Herbs, or that we should put them in such a consternation as they put us here.

I do

I do not at all doubt it, said I, I would very fain know why the Gentlemen of the *Moon* should have more Wit than we, or what right have they to scare us, more than we have to scare them? And I believe, said I laughing, that as there have been and are an infinite number of Fools that adore the *Moon*, so there are likewise in the *Moon* people that adore the *Earth*, and we are upon our knees one to another: After all this, says she, we may well pretend to send Influences to the *Moon*, and give the *Crisis* to their Diseases. But as but very little Wit and Ability is sufficient in the people of that Country, to destroy all those Honours we flatter our selves withal; I must confess, I am still afraid we have somewhat the disadvantage.

Fear not, said I, it doth not appear that we are the only foolish *Species* in the World. Ignorance is a certain Good proper to be generally diffus'd; and tho' I only guess at that of the people of the *Moon*, yet I no more doubt it, than the most certain news that comes from thence.

And what certain news is that, says she? 'Tis that, said I, that is daily brought us from thence by the learned, who travel thither with their long Perspectives; they'll tell you what Discoveries they have made of Lands, Seas, Lakes, mighty Mountains and profound Abysses.

You surprize me, says she, I apprehend well that they may discover in the *Moon* Mountains and Abysses, that is apparent in her inequalitys; but how can they distinguish Sea and Land? Thus, says I; because the Waters that let part of the Light pass through them and reflect less, appear at a distance obscure Spots, and the Land, which by its solidity reflects all the Light, is the brighter part. All those parts are so well known, that they have all Names given them, and generally they are Names of learned Men.

ed Men. One place is call'd *Cobernicus*, another *Archimedes*, another *Galileo*, there's a *Caspian* Sea, *Porphyrian* Mountains, a *black Lake*, and in fine the Description of the *Moon* is so exact, that should a learned man be now there, he'd no more lose his Way than I should do in the Streets of *Paris*.

But, says she, I should be very much pleas'd to know more in particular how the more inland part of the Country is made. It is not possible, said I, that the Gentlemen of the Observatory should inform you; you must inquire of *Astolphus*, who was conducted thither by St. *John*, 'tis one of the most pleasant fables of *Ariosto*, and I am sure you will be well pleas'd to hear it. I confess, he had done better not to have introduc'd St. *John*, a Name worthy of Veneration, but 'tis a Poetical Licence, that may pass for only too much Gayty. The whole Poem is dedicated to a Cardinal, and a great Pope has honour'd it with a glorious Approbation, which is to be seen before some Editions. The Story is thus, *Roland* Nephew to *Charlemain* was run mad because the Fair *Angelica* had prefer'd *Medor* before him: *Astolphus* the brave *Paladin* found himself one day in the Terrestrial Paradise upon the top of a very high Mountain, whither he had been carried by his *Hippogriff*, he met there with St. *John*, who told him, that to cure *Roland's* Madness it was necessary they should both together take a journey to the *Moon*. *Astolphus*, who desir'd nothing more than to see Countries, needed not much solicitation, and they had presently at hand a Chariot of Fire that mounted the *Apostle* and the *Paladin* up into the Air. *Astolphus*, who was no great Philosopher, admir'd to see the *Moon* much bigger than she had appear'd to him from the Earth, and he was yet more surpriz'd to find other Rivers, other Lakes, Mountains, Towns and Forrests, and (which would have surpriz'd me as much) Nymphs hunting in those Forrests;

Forrests : But that which he found most rare in the *Moon* was a great Vale, where was to be found all that was ever lost upon the Earth, of what kind soever, Crowns, Riches, Renown, an infinity of Hopes, Time lost at Play, Alms appointed after Death, Verses presented to Princes and the Sighs of Lovers.

As for the Sighs of Lovers, said the Marchioness, interrupting me, I know not whether in the days of *Ariosto* they were lost or not, but now adays I know none that go to the *Moon*. Were there none but you, Madam, said I, all those that have been address'd to you, are fled thither, and they are enough to make a considerable body. In fine, the *Moon* is so exact in collecting all that is lost here below, that all is to be found there, even to the Donation of *Constantine*, but this *Ariosto* tells you in your ear. The thing is, the Popes that have pretended themselves Masters of *Rome* and *Italy* by vertue of a Donation from the Emperour *Constantine*, and the truth is, no man knows what's become of it. But guess you what sort of thing is to be found in the *Moon*. Folly. All that has ever been upon the face of the Earth, is there carefully preserv'd. It is not credible how many lost Wits are in the *Moon*. They are so many Phiols full of a most subtil Liquor, which easily evaporates, unless the Phiol be close stop'd, and upon every Phiol is written the Name of him to whom the Wit belongs. *Ariosto* sets them altogether : but I chuse rather to represent to my self, that they are rang'd in good order in a long Gallery. *Altolphus* was much amaz'd to find that the Phiols of many, whom he always thought very wise, were very full ; and for own part, I believe that my own is grown pretty full since I entertain'd you with Visions, sometime Philosophical, sometime Poetical ; but that which comforts me, is, that 'tis not impossible but that in
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all that I say to you, I shall procure you likewise a little Phiol in the *Moon* e're it be long. The good *Paradin* fail'd not to find his own there among the rest, and presently laying hold on't, with permission of *St. John*, he snuffed it up at his nose, like the Queen of *Hungaries* Water, but *Ariosto* says that he carried it not far, but let it return again to the *Moon* by a Folly he committed sometime after. However he forgot not the Phiol of *Roland*, which was the business of his journey, and he had trouble enough in carrying it; for the Wit of that *Hero* was very heavy, and there was not a drop wanting. In fine, *Ariosto*, according to his laudable custom of saying what he pleases, makes this Apostrophe to his Mistress, in excellent Verse. *Who, my Fair one, shall mount up to Heaven to bring back my Wits lost by your Charms? I should not lament the loss, provided they were gone no further; but if matters continue as they have begun, I must expect to become even such as I have describ'd Roland. Yet I hardly believe that to recover my Wits, it will be necessary that I travel through the Air to the Moon; my Wits are not fled so high, they are still hovering about your eyes and mouth; and if you desire I should recover them, give me leave to take them with my Lips. Is not this pretty? For my part, to argue like Ariosto, I would advise that none should ever lose their Wits but for Love; for you see they go not far, and there needs no more than a pair of Lips to recover them; but when they are lost by other means, as we, for example, lose them now in Philosophizing, they fly to the Moon, and are not to be recover'd at pleasure. To make amends, said the Marchioness, our Phiols shall be honourably set in the quarter of Philosophical Phiols; whereas otherwise perhaps our Wits might run astray here to somebody unworthy of them. But to make an end of losing mine, pray tell me, and tell me very seriously, whether*

ther you think that there are Men in the *Moon* or not; for hitherto you have not discours'd to me of of any thing positively enough. Who I? says I, I do not at all believe there are Men in the *Moon*. Do but observe how the face of Nature is chang'd in the distance between this and *China*; you find other Faces, other Figures, other Manners and almost other principles of Reason; and certainly in such a distance as between this and the *Moon*, the change ought to be much more considerable. When we go to some Lands newly discover'd, we find the Inhabitants scarce Men; they are a sort of Animals in humane shape, and sometime imperfect enough, but almost wholly without reason: therefore surely he that should go on to the *Moon*, would not find them Men at all.

What sort of people would they be then, said the Marchioness, with some impatience? In good Faith, Madam, said I, I cannot resolve you. If it were possible that we had Reason, and yet were not Men, and that we were the Inhabitants of the *Moon*, could we well imagine that there were such Creatures here below as we call Mankind? Could we represent to our selves a thing in Passions so foolish and so wise in reflection, of so short a duration and so long a foresight, so much knowledge in things unprofitable and so much ignorance in the most important, so great a desire of liberty, & so much inclination to Servitude; so much desire to be happy, & so great an incapacity of being so? the People of the *Moon* must have a great deal of sense to divine all this. We see our selves daily, and yet are to seek to know how we are made. It made some say, that the Gods were full of *Nectar* when they made Man, and when they came to look upon their Work in a sober temper, they could not forbear laughing.

Well then, said the Marchioness, I see we are secure of the people of the *Moon*, they'l not discover

us; but I should be very glad we could know them: for, to tell you truth, it much disquiets me to know that they are there above in that *Moon* that we now see, and that we cannot at all represent to our selves how they are made. And why, said I, are you not concern'd too for the Inhabitants of that great *Terra Australis*, which is hitherto utterly unknown to us? both they and we are carried in one Vessel, they in the Proe and we in the Poup; you see there is no Communication between the Proe and the Poup, and that at one end of the Ship 'tis not known what sort of people are in the other; yet you would know what's done in the *Moon*, that other Vessel that sails in the Heavens at so great a distance from us.

Oh! says she I reckon the Inhabitants of the *Terra Australis* as known; for 'tis certain they must needs resemble us very much, and in fine, we may know them when ever we take the pains to go see them, there they are and cannot avoid us; but the people of the *Moon*, we shall never know, 'tis that I despair of. If I should answer you seriously, said I, that we know not what may come to pass, you would laugh at me, and I should well deserve it, but in the mean time I could defend my self well enough if I pleas'd. I have a thought in my head that is very ridiculous, which yet (I know not how I got it, being so impertinent as it is) has some appearance of truth. I'll hold a Wage, that I'll bring you to acknowledge against all reason, that there may be in time a Commerce between the *Moon* and the *Earth*. Consider with your self the Circumstances of *America*, before it was discover'd by *Christopher Columbus*, the Inhabitants lived in the extremest Ignorance, so great strangers to knowledge, that they knew not the most simple and most necessary Arts, they went naked, had no Arms but the Bow, and could never imagine that Men could be carried by Animals; they look'd upon the
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the Sea as a great space prohibited to Men, that it was joyn'd to the Heavens, and that beyond it was nothing. 'Tis true, after spending whole years in making hollow the Trunk of a great Tree with sharp stones, they put to Sea in that Trunk, and coasted the Shoar with Wind and Tide; but as that Vessel was often subject to overfet, they were as often put to swim to recover it; and, to speak properly, they constantly swam, only then when they took breath in their Boats. Whoever should have told them that there was another sort of Navigation incomparably more perfect, that men could traverse that vast extent of Waters where and how they pleas'd, that they could stop without motion in the midst of the rolling Waves, and command the swiftness of their Course; and in fine, that the Sea, vast as it is, was no obstacle to the Communication of people, provided there were people on the other side, you may well imagine they would never have believ'd it. Yet you see the time came, that the strangest Spectacle in the World, and the least expected by them, appear'd before them, huge enormous Bodies that seem'd to fly upon Sea with white Wings that vomited fire on all sides, and cast upon their Shoars an unknown sort of people clad with Iron, governing those Monsters that ran upon the Sea, as they pleas'd, and bearing Thunder in their Hands that beat down all before them. From whence come they? Who could bring them over Sea? Who put the Fire in their power? Are they Gods? Are they Children of the *Sun*? For certainly these are not Men. I know not, Madam, whether you conceive, as I do, the great surprize of the *Americans*, but certainly never any equall'd it. After all this, I will no more swear that there will not be in time a Commerce between the *Moon* & the *Earth*. Could the *Americans* believe that ever there should be any be-

tween *America* and *Europe*, and that they alone should not know it? 'Tis true, there is a great space of of Air and Heaven to be travers'd between the *Earth* and the *Moon*, but did those great Seas appear to the *Americans* any more fit for passage? Seriously and truly, says the Marchioness, looking upon me, you are a Fool. Who says the contrary, said I? But, says she, I'm not content with your Confession, I'll prove it to you. The *Americans* were so ignorant that they never minded whether those vast Seas could be passed or not, but we that are so knowing would needs imagine a passage through the Air, if it were possible to go there. A thing possible, said I, is more than imagination; Men begin already to fly a little, several persons have found the secret of fitting themselves with Wings, that support and give them motion in the Air, and they can fly over Rivers, and from Steeple to Steeple. 'Tis true, 'tis not the flight of an Eagle, and it has cost those new Birds sometimes a Leg or an Arm; but that in the mean time does but represent the first Planks that were set a float, and were the beginning of Navigation. There was a great distance or difference between those Planks and a great Ship that could make a Circuit about the World, yet by little and little they are grown up to a great Ship. So the Art of Flying is yet in its infancy; it will daily grow towards perfection, and sometime or other we shall get up to the *Moon*, Can we pretend to have discover'd all things, or to have proceeded so far that nothing is to be added? Ah! we must needs allow that there is something yet to do for the Ages to come. I will never allow, says she, that any man can fly, without breaking his neck. Well, said I, if you will have it that they fly so ill here, they'll fly better in the *Moon*; the people there are fitter for the Art than we, and 'tis no matter whether we

go to them or they come to us, just so the *Americans*^s could not dream of the Art of Navigation, when at the other end of the World it was well understood. Why then, says she, almost angry, the people of the *Moon* should be already come. The *Europeans*, said I, ready to laugh, did not discover *America* till after 6000 years, so long was requisite to bring Navigation to that perfection, as to venture to pass the Ocean, the people of the *Moon* can possibly make little voyages in the Air, and at this hour they are exercising, when they are grown more knowing and expert, we shall see them, and God knows what a surprize 'twill be. You are insufferable, said she, to conclude me with such empty Arguments. If you provoke me, said I, I know what I can yet add to confirm them. Observe that the World discloses it self by little and little; the *Ancients* held it for certain that the torrid and frozen Zones were not habitable, and in the time of the *Romans* the general Map of the Earth was not much bigger than the Map of the Empire, which had much of Greatness in one sense and Ignorance in another; in the mean time Men have been found to inhabit both in the hot and cold Climates. See there the World enlarged: So likewise it was thought that the Ocean cover'd all the Earth, but what was then known, and that there was no *Antipodes*; for they were never heard of; and also could they have had their Feet upward and their Head downward? After so pleasant a reasoning, the *Antipodes* are discover'd, and there's a new Reformation of the Map, and a new half of the World. Understand me well, Madam; Those *Antipodes* so discover'd beyond all expectation, ought to instruct us to be wary in our Judgment. The Discovery of the World will possibly be finished by us, and we shall know all as far as the *Moon*: We have not yet attain'd so far; because as yet all the Earth is not

discover'd, and because all must be done in order. When we know our own habitation well, it will be allow'd us to make acquaintance with our Neighbours without lying, said the Marchioness looking attentively on me, you are so serious in this thing, that doubtless you must needs believe all you say, I should be sorry for that, said I, I would only lett you see, that a Chimerical opinion may be maintain'd well enough to confound a person of witt, but not enough to perswade 'tis only truth that perswades, and that even not without producing all its proofs, it insinuates so naturally into the mind, that we seem only to remember it, though it be the first time we heard of it. Ah! says the Marchioness, you now give me some comfort; your fallacious reasoning made me sick. I am now in a better condition to go to bed and sleep quietly, if you think fit that we retire.

T H E

Third Evening.

THe Marchioness would have engag'd me to prosecute our Entertainments in the day time; but I told her, that we ought not to trust our Chimerical Notions to any but the Moon and Stars; for they were the Object of them, We sail'd not then in the Evening to take our Walk into the Park, which was now become a place consecrated to our learned Conversation.

I have News to tell you, said I. The *Moon*, which I told you yesterday was according to all appearance inhabited, may possibly not be so; I have thought of a thing that indangers the Inhabitants. I cannot suffer that, says she; Yesterday you made me expect

expect to see them soon here, and now there's n^o such people in the World. You shall not delude me so. You made me believe the Inhabitants of the *Moon*.* I have overcome the difficulty of doing so, and I will believe it. Not so fast, said I, you ought to yield your self but by halves in things that are to be believ'd, and to reserve one half free where the contrary may be admitted, if occasion be. I'm not to be satisfied, said she, with Sentences; let's go to the matter: Are we not to argue of the *Moon*, as of *St. Denis*? No, said I, the *Moon* is not so like the Earth, as *St. Denis* is to *Paris*. The *Sun* raises from the Earth and Waters Exhalations and Vapours which mount in the Air to a certain height, where they gather and form the Clouds. Those Clouds hanging there, fly irregularly about our Globe, and shadow sometime one Country, sometime another. Whoever should see the Earth at a distance, would often observe great changes upon the surface; for a large Country cover'd with Clouds would appear an obscure part, and would become luminous as the Clouds remov'd. The Spots would appear to change place, or gather in diverse manners, or wholly disappear: So likewise we should see the same changes in the face of the *Moon*, if she had Clouds about her: but on the contrary all her Spots are fix'd, her parts always luminous, and there's the mischief on't. By this account the *Sun* raises no Vapours nor Exhalations about the *Moon*. It must therefore be a body infinitely more hard and solid than our *Earth*, and the more subtil parts of it easily disengage themselves from the others, and mount on high as soon as they are put in motion by the Heat: So that it must be a mass of Rocks and Marble where there are no Evaporations: For they are so naturally & necessarily rais'd where there are Waters, that there must needs be no Water where there

is no Vapour. What are then the Inhabitants of those Rocks, which can produce nothing, and of that Country that has no Water? How now! cry'd she, have you forgot that you assur'd me there were Seas in the *Moon* to be seen from hence? That's but a conjecture, said I, I am sorry for it; those obscure parts which are taken for Seas, perhaps are but great Cavities: at this distance it may be allow'd not to guess exactly right. But, says she, is that sufficient to make us renounce the Inhabitants of the *Moon*? Not wholly, Madam, said I, we will neither conclude for them nor against them. I must confess my Weakness, says she, I am not capable of so perfect an irresolution; I must believe. Fix me presently in some one opinion concerning the Inhabitants of the *Moon*; let us preserve them or annihilate them for ever, that they may be no more spoken of; but rather let us preserve them, if possible; for I have entertain'd an inclination for them which I can hardly quit. Why then, said I, I will not leave the *Moon* a Desert, let us people it again to satisfy you. In truth, since the Appearance of the Spots of the *Moon* do not change, it cannot be believ'd that that there are Clouds about her that darken sometimes one part, sometime another; but yet that doth not argue that she doth not send out Vapours and Exhalations. Our Clouds which we see carried in the Air are but Exhalations and Vapours, which at their rising from the Earth are separated in particles too small to be seen, and which when mounted a little higher meet a Cold that condenses them, and renders them visible by the union of their parts, after which they become gross Clouds that float in the Air, where their bodys are strangers till they fall in Rain: But those very Vapours and Exhalations are sometimes dispersed enough to become invisible, and do not reunite, but when they form a subtil Dew,
which

which is not seen to fall from any Cloud. It may be likewise that the Vapours which rise from the *Moon*; (for it must needs be that some do arise from her. It is not credible that the *Moon* should be a body of so equal a solidity in its parts, all equally in repose one after the other, and all incapable of receiving any change by the action of the *Sun* upon them: We do not know any such body in nature. Marble it self is not so; Whatever is most solid changes and alters, either by a secret and invisible motion in it self, or by some that it receives from without;) it may be then that those Vapours that rise from the *Moon*, do not gather about her in Clouds, nor fall back upon her in Rain, but only in Dew: and for that, it is sufficient that the Air, with which the *Moon* is apparently surrounded, as our Earth is with hers, is somewhat different from our Air, and the Vapours of the *Moon* somewhat different from the Vapours of the Earth, which is a thing more than probable. Upon this account it will follow, that the matter being otherwise dispos'd in the *Moon* than upon the Earth, the effects must be different; but it matters not. From the moment that we have an interior motion in the parts of the *Moon*, or produc'd found by foreign causes, the Inhabitants of the *Moon* are restor'd, and we have a fund necessary for their subsistence. This will furnish us with Fruit, Corn, Water, and all that we desire. I mean Fruit, Corn and Water, such as are in the *Moon*; for I profess not to know of what sort they are, all fit for the use of the Inhabitants, whom I know as little.

That is to say, says the Marchioness, that you only know all is well there, but know not how: 'tis indeed a great deal of ignorance with a little knowledge, but we must be content; I am but too happy that you have restor'd to the *Moon* her Inhabitants, I am likewise well pleas'd that you allow her
Air

Air to cover her; for otherwise I should think a Planet too naked.

Those two different Airs, said I, do much contribute to hinder the Communication of the two Planets. If there were no more than flying in the matter, who knows, as I told you yesterday, but that in time we may fly well enough. Yet I confess there is no great appearance of it, the great distance of the *Moon* from the *Earth* would be one difficulty to overcome, which is certainly considerable; but were there no such difficulty, and that the two Planets were very near, it would not be possible to pass from the Air of one to the Air of the other. Water is the Air of Fishes, they never pass into the Air of Birds, nor Birds into the Air of Fishes, not that the distance hinders them, but because each of them is confin'd to his own Air. We find that ours is mixt with Vapours more thick and gross than that of the *Moon*, therefore should an Inhabitant of the *Moon* venture upon the Confines of our World, he'd be drown'd in our Air at his first arrival, and we should see him tumble down dead before us.

Oh! cry'd the Marchioness, how I should rejoyce at a Shipwrack that would lay before us a good number of those people. We might then consider those extraordinary Figures at our leisure. But, said I, if they were expert enough to sail upon the exterior surface of our Air, and should lay Nets and Hooks for us as we do for Fishes, would that please you? Why not, says she, laughing? for my part I would willingly put my self into their Nets, only to have the satisfaction of seeing them that caught me.

But bethink your self, said I, that you may be ill when you arrive at the top of our Air, we cannot breath in all its extent, it must needs be so, for we cannot breath upon the tops of some Mountains;
and

And I much wonder that those that have the folly to believe that certain corporeal *Genii* inhabit the purest Air, do not likewise say, that the reason why those *Genii* come so seldom to us, and make such short Visits, is because few among them are expert in Diving, and those that are, cannot dive to the bottom of our thick Air, to stay any long time. So that here you see three natural Barricades to prevent our going out of our World or entering that of the *Moon*. Yet let us try for our satisfaction, to guess what we can of that World. I believe, for example, that we might see the Heaven, *Sun* and *Stars* of another colour than we see them here. We behold all those Objects here through a kind of natural Perspective which shews them otherwise than they are, that Perspective is our Air, mixt as it is with Vapours and Exhalations, which extend not very high. Some Moderns pretend that in it self it is of a blue colour, as well as the Sea, and that that colour appears not either in the one or the other, but in a great depth. The Heaven of the fixed Stars, say they, has of it self no light, and consequently it would appear black; but we see it through the Air which is blue, and represents it blue to us. If that be so, the Rays of the *Sun* and Stars cannot pass through the Air without receiving a little tincture of that colour, and losing some of their own; but were it so that the Air had no colour of its own, it is certain that the Light of a Flambeau seen through a thick mist appears red, though it be not its natural colour, and our Air is no more than a thick mist that changes the colour of the Heaven, *Sun* and Stars. So that the Air of the *Moon* being of another nature than our Air, or having in it self a tincture of another colour, or at least being another mist that causes that change of colour in the celestial bodies, the Perspective through which all is seen,

seen, in respect of the people of the *Moon* is changed.

That, says the Marchioness, makes me prefer our abode before that of the *Moon*; for I cannot believe that the Appearance of the celestial colours is so pleasant there as here. Let us suppose a red Sky and green Stars, they will not agree so well together as Stars of a pure Gold-colour upon blue. Any that heard you, says I, would think you were dressing up a Suit of Clothes, or furnishing a Room; but believe me, Nature understands well enough what she does, leave it to her to invent a mixture of Colours for the *Moon*, and I'll undertake it shall be well approved. She fail'd not to work variety of Prospects in the Universe at every turn of the eye, and yet the variety is still pleasing.

I know her Artifice, said the Marchioness, she spar'd her self the pains of making variety of Objects, and only chang'd the Perspectives; so that she has the Honour of that great Diversity without being at the Expence. With a blue Air she gives us a blue Sky, and possibly with a red Air she gives the Inhabitants of the *Moon* a red Sky, but still 'tis the same Sky. In my opinion she has likewise plac'd in our imagination certain Perspectives, through which we see all, and which change the Objects in respect of every particular man. *Alexander* saw the Earth a fair place fit for the Seat of a great Empire; *Celadon* sees it only as the abode of his *Astrea*, and a Philosopher sees it only as a great Planet moving in the Heavens and throng'd with Fools. I do not believe that the prospect is more different between the Earth and the *Moon*, than between Imagination and Imagination.

The change of the Prospect, says I, is more surprising in our Imaginations, for they are but the same Objects which we see differently; but in the

Moon

Moon other Objects are to be seen, or none of those that are seen here, possibly in that Country they know not *Aurora* nor the Twilight, before the *Sun* rises and after he sets; the Air that surrounds us and is rais'd above us, receives Rays which cannot fall upon the Earth, and being very thick, it stops some of them & reflects them upon us, tho they were not naturally design'd for us. So that *Aurora* and the Twilight is a particular favour of Nature, a Light which regularly we ought not to have, and which she gives us over and above our due. But it may not be so proper in the *Moon*, where the Air is apparently more pure, to beat down the Rays of the *Sun* before he rises or after he is set. You have not there that favourable Light, which growing upon you by degrees prepares you easily for the Arrival of the *Sun*, and which by the same degrees declining prepares you for his absence. You are in a profound Darkness, and all on a sudden, as though a Curtain were drawn, you find your eyes struck with the Light of the *Sun*; again you are in a bright and vigorous Light, and all on a sudden you drop into a profound Darkness, the day and night are not joined with a middle light that participates both of the one and the other. The Rainbow is likewise a thing wanting to the people of the *Moon*; for as the *Aurora* is an effect of the grossness of the Air and Vapours; so the Rainbow is form'd in Clouds from whence falls the Rain, so that we are oblig'd for the most beautiful thing in the World, to that which is the least so. Since then there are no gross Vapours about the *Moon*, nor rainy Clouds, farewell Rainbow, farewell *Aurora*, to what now must we resemble the fair ones of that Country? What a source of comparisons is there lost! I am not much concern'd, said the Marchioness, for those comparisons, and I find recompense enough in the *Moon* for the want of
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the Rainbow and *Aurora*; for by the same reason there is neither Thunder nor Lightning, both which are form'd in the Clouds, the days are still fair and serene, and the Sun in the day time never out of sight, the Stars are visible all night, no Storm or Tempest is ever known, nor any thing that is an effect of an angry Heaven. What reason do you find then of Complaint? You represent the *Moon* to me, said I, as an enchanted abode, but in the mean time I know not whether it be so pleasant to have daily a scorching *Sun* over a mans head, and not a Cloud to moderate the Heat, it may be likewise 'tis therefore Nature has made certain kind of Pits in the *Moon* big enough to be discern'd by our Glasses; for they are not mountains, but hollow places which appear in the midst of certain plains. How do we know but the Inhabitants of the *Moon* shelter themselves there from the extremity of the Heat? possibly they live no where else but there, and 'tis there they build their Towns. We see here that the Subterranean *Rome* was almost as big as *Rome* above the Earth; there needs no more than to take away this, the rest will be a Town like those in the *Moon*; a whole Populace is together in one of those Cavities, and from one to another they communicate by subterraneous ways. You laugh now at this Vision, and I heartily agree you should, but in the mean time to tell you seriously, you may be deceived sooner than I. You think the people of the *Moon* ought to inhabit upon the surface of their Planet as we do upon ours. 'Tis quite contrary; though we live upon the surface of our Planet, they may not at all live upon the surface of theirs, all things ought to be very different here from what they are there.

'Tis no matter, said the Marchioness, I cannot resolve to let the Inhabitants of the *Moon* live in perpetual obscurity. But you would be yet more concern'd,
said

said I, if you knew that an ancient and great Philosopher has made the *Moon* the abode of blessed Souls. All their Happiness consists in hearing there the Harmony which the celestial bodies make in their motions ; but he pretends that when the *Moon* falls in the Shadow of the Earth, they cannot then hear that Harmony, and 'tis then those poor Souls cry out desperately, and the *Moon* makes what haste she can to deliver them out of that trouble. We may then, says she, expect to see the happy Souls of the *Moon* here ; for 'tis certain they are sent likewise to us, as to their Paradise, and between those two Planets, the *Moon* and Earth, 'tis thought sufficient provision is made for the happiness of Souls by mutually transporting them into each others World. Seriously, said I, it would be no small pleasure to see many different Worlds ; 'tis a pleasure to make the Voyage in imagination only, 'twould surely be much more so in effect. It would be much better than to go from hence to *Japan*, that is to say, than to take the pains to run from one corner of the Earth to another, and all to see nothing else but men. Well, says she, let us take a Voyage about the Planets, as well as we can. What should hinder us ? Let us place our selves in all those different points of sight, and from thence consider the World. Have we no more to see in the *Moon* ? I think not, said I, at least I have shewn you all that is within my knowledge. Leaving the *Moon* and bending our Course toward the *Sun*, we meet *Venus*, and in *Venus* I return again to Saint Denis. *Venus* turns about her self and about the *Sun*, as the *Moon* doth ; and it is found by the Telescope that *Venus*, as well as the *Moon*, has her Increases and Decreases, and is full, according to her diverse scituation in respect of the Earth.

The *Moon* according to all appearance is inhabited, why not *Venus* as well ? But, says she, in saying
still,

still, *why not*, you seem to design Inhabitants for all the Planets. Doubt it not, said I, that *why* has a vertue in it sufficient to people all. We see that the Planets are all of the same nature, all opaque bodies that receive no Light but the *Suns*, which they reflect from one to another, & have all the same motions; thus far all are equal. In the mean time we must conceive that those great bodies are made to be uninhabited, that that's their natural Condition, and that the Earth only was exempted from it. He that will believe so, let him believe; for my part I cannot concur with him. I find, says she, that you are very very much confirm'd in your opinion within this little while; it is not long since the *Moon* was made a Desert, and you were not much concern'd at it, and now should any one venture to tell you that all the Planets are not inhabited as the Earth is, I find you would be angry. 'Tis true, said I, at that moment when you surpriz'd me, had you contradicted me about the Inhabitants of the Planets, I should not only have maintain'd them against you, but I believe I should have told you how they are all made. There are moments for believing, and I never believ'd it so much as at that moment. But now in a cooler Judgment, I think it would be very strange that the Earth should be so well inhabited as it is, and the other Planets not at all; for I would not have you think that we see all that inhabits the Earth, there are as many species of Animals invisible as visible. We see down from the Elephant to the Mite and the Cicon, there our sight terminates; but from the Mite and the Cicon begins an infinite multitude of Animals to which the Mite is an Elephant, and which are not discernable to our plain sight. Glasses have discover'd to us many Liquors full of little Animals, which we should never have suspected to have been there; and 'tis not impro-

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bable that the Taste and Relish of those Liquors proceeds from the biting or stinging of those Animals upon the tongue and palate. Do but mix some things with some of those Liquors, or expose them to the *Sun*, or let them corrupt, and you shall presently see a new species of little Animals.

Many bodies that seem solid, are only a heap of those indiscernable Animals, which find as much liberty for motion there, as they need. The Leaf of a Tree is a little World, inhabited by invisible Worms, to whom it seems a place of immense extent, there they find Mountains and Abysses, and the Worms that inhabit on one side of the Leaf, have no more communication with those on the other side, than we have with the *Antipodes*. With much more reason, in my opinion, a great Planet may be a World inhabited. There has been found even in some kind of exceeding hard Stones innumerable little Worms lodg'd in all parts in insensible vacuities, and were only nourish'd with the substance of the stone; imagine with your self how many little Worms there might be, and how many years they subsisted upon a bit no bigger than a grain of Sand; and according to this example, were the *Moon* only an heap of Rocks, rather than there should be no Inhabitants, I would make them gnaw upon those Rocks. In fine, all things have Life, all are animated; take you all those species of Animals newly discover'd, and those that we may easily judge are yet to be discover'd, together with those that we daily see, and you will certainly find that the Earth is well peopl'd, and that Nature has been so liberal in Animals, that she never took care that half of them should be seen: do you believe then, that having been so fruitful in her Productions here even to excess, she has been so barren in the other Planets, as to produce nothing living?

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I am convinc'd, said the Marchioness, in my reason; but my imagination is overwhelm'd with that infinite multitude of Inhabitants in all the Planets, and confounded with the diversity that must needs be among them; for I well see that Nature, as she is an enemy of repetitions, has made them all different, but how shall we represent it? The Imagination, said I, cannot pretend to represent it, she can go no farther than the Eyes lead her: one certain general view may give a prospect of that diversity that Nature has wrought in all those Worlds. All Faces in general are wrought according to one and the same model, but those of two great Nations, of the *Europeans*, for example, and *Africans* seem to be fram'd to two particular models, and we may yet find a particular model in the Faces of every Family. What secret should Nature have in framing such variety in one only thing so simple as a Face? We are in the Universe but as one little Family, where all the Faces resemble; another Planet is another Family, where the Faces have another Air.

'Tis most certain that the differences increase in proportion to the distances, and whoever should see an Inhabitant of the *Moon* and an Inhabitant of the *Earth*, would easily observe that they were of two Worlds nearer Neighbours than an Inhabitant of the *Earth* and an Inhabitant of *Saturn*; here for example we use the Voice, in another place they speak but by Signs, and farther off they speak not at all: Here Reason is wholly form'd by Experience, there Experience contributes little, and farther off old men know no more than children: Here we perplex ourselves more for the future than what is past, farther off they concern themselves neither for the one nor the other, and those perhaps are not the most unhappy. It has been thought that we want a sixth

natural Sense, by which we might know many things
more

more than we do; that sixth Sense is doubtless in some other World, where possibly they want some one of our five: Nay, perhaps there are really a great number of natural Senses; but in the Distribution made with the Inhabitants of other Planets, only five fell to our share, wherewith we content ourselves, because we know no other. Our Knowledge has certain bounds and limits which the Mind of Man cannot exceed, there is a certain point where it wholly fails us, and the rest is for some other World, where likewise something that we know is unknown: This Planet enjoys the Sweets of Love, but in many parts is laid desolate by the fury of War: In another Planet they enjoy perpetual Peace, but know nothing of Love, and are uneasy. In fine, what Nature has done in little among men in her distribution of Happiness or other Talents, she has doubtless done in great among the several Worlds, and did not at all forget that wonderful secret of hers in working a variety in all things, and yet at the same time making them equal by Compensations.

Well, Madam, said I, laying aside my serious tone, are you now satisfied? Have I given you Chimeras enough? Truly, says she, I have now less trouble methinks to find out the difference of all those Worlds, my Imagination is now busie about the Plain you have given me. I represent to my self, as well as I can, extraordinary Characters and Customs for the Inhabitants of the Planets, and I frame strange and extravagant figures for them. I cannot well describe them to you, but I see something. As for those figures, says I, I advise you to remit them to the Dreams you will have this night, we shall see to morrow whether they assisted you well in it, and inform'd you of the Shape of the Inhabitants of any Planet.

T H E

Fourth Evening.

Our Dreams were not successful, they only represented something resembling what we had seen, and I had opportunity of reproaching the Marchioness, as those people who never draw any thing but what is extravagant and grotesque reproach us at the sight of our Pictures. *Very well*, say they, *those are men to the life, there's nothing there of fancy*. We were fain then to be still ignorant of the Figures of the Inhabitants of the Planets, and content our selves with guessing at them as well as we could, continuing the Voyage we had began about the World: we were in *Venus*. 'Tis certain, said I to the Marchioness, that *Venus* turns about her self, but 'tis not well known in what time, nor consequently how long her days are; as for her years, they are but eight months, for in so much time she turns about the *Sun*. She is forty time less than the *Earth*, therefore the *Earth* in *Venus* seems a Planet forty times bigger than *Venus* appears to us from hence: and as the *Moon*, is likewise forty times less than the *Earth*, she seems in *Venus* very near about the same bigness that *Venus* appears to us from hence.

You vex me, said the Marchioness, I see well that the *Earth* is not for *Venus*, the *Star of Shepherds* and *Mother of Love*, as *Venus* is to the *Earth*; for the *Earth* in *Venus* appears too big, but the *Moon* that appears there of the same bigness that *Venus* doth to us from hence, is of a just proportion to be the *Mother of Love* and *Star of Shepherds*; those names are only

ly fit for a little Planet that is brisk, clear, sparkling, and of a gallant Air. 'Tis certainly a destiny very pleasing to our *Moon*, to influence the Loves of the Inhabitants of *Venus*; those people must needs understand Gallantry well. Oh! no question on't, said I, the little people of *Venus* are made up of none but *Celadons*, and *Sylvanders*, and their most ordinary Conversation is beyond the most polite of *Clelia*, the Climate is extremely favourable for Love; *Venus* is nearer the *Sun* than we, and she receives from him a Light more lively and hot.

I now see, said the Marchioness, interrupting me, how the Inhabitants of *Venus* are made, they are like the *Moors* of *Granada*, a little black people, Sun-burnt, full of spirit and fire, always amorous, given to Poetry and Musick, and every day Feasting, Dancing and Tilting. Let me tell you, Madam, said I, you know but little of the Inhabitants of *Venus*; our *Moors* of *Granada* for the coldness and stupidity of their Temper would be to them but as people of *Lapland* or *Grænlând*.

But what are the Inhabitants of *Mercury*? they are yet nearer the *Sun*, and therefore certainly must needs be fools with too much vivacity. I believe they have no memory no more than the greatest part of *Negro's* and that they never consider on any thing, nor act but by chance, and suddain motions; and in fine, that *Mercury* is the *Bedlam* of the Universe. They see the *Sun* much bigger than we do, because they are much nearer, and he gives them so strong a light, that were they here, they would esteem our fairest days but as weak twilight, and perhaps would not be able to distinguish Objects by it, and they are us'd to so excessive a Heat, that they would freez in the midst of *Africa*; their year is but three months, the length of their day is yet unknown to us; for *Mercury* is so little and so near

the *Sun*, in whose Rays he is almost continually lost, that he escapes all observation of Astronomers, and they cannot yet lay hold on him so much as to observe what motion he makes about his Center: but his smallness makes them believe that he performs that Course in a little time, and that therefore the days in *Mercury* are short, and that the Inhabitants see the *Sun* like a great burning Stove or Kettle not far above their heads, and moving with a prodigious rapidity. It is well for them, for 'tis certain they are very desirous of the night, during which time they are inlightened by *Venus* and the *Earth*, which ought to appear very big to them. As for the other Planets, they being beyond the *Earth* toward the Firmament, seem less to them than they do to us, and they receive but little or perhaps no Light at all from thence. The fixed Stars likewise seem less to them, and many are not seen at all, which in my opinion is a loss. I am not well pleas'd to see that great Arch adorn'd with lesser Stars, and not to see the rest but in a less proportion and a duller colour.

I am not, said the Marchioness, so much concern'd at that loss of the Inhabitants of *Mercury*, as at the inconveniences they suffer by the extremity of Heat. I wish we could procure their ease; therefore pray let us allow in *Mercury* long and abundant Rain to refresh them, as 'tis said it falls here in hot Countrys for four months together just in the hottest Seasons.

That may be, said I, and we may likewise refresh *Mercury* another way. Some parts of *China*, which by their situation ought to be very hot, are yet so extreme cold in the months of *July* and *August*, that the Rivers are frozen: The cause is, those Countrys are full of Saltpeter, the Exhalations whereof are very cold, and the great Heats exhale them from the Earth in great abundance. *Mercury*, if you please, shall be a little Planet all of Saltpeter, and the Sun shall

shall produce from it self a remedy for the evil that it caused. Most certain it is, that Nature cannot make people live any where but where they can live, and that Custome joyn'd with Ignorance of what is better, makes them live there well enough. So in *Mercury* they may live well enough without Saltpeter or Rain.

Next after *Mercury* you know is the *Sun*, there is no way of making him habitable, the cause is clear. We judge by the Earth that is inhabited, that other bodies of the same species may be so likewise, but the *Sun* is not a body of the same species with the Earth, nor with the other Planets; he is the Fountain of that Light, which the other Planets only reflect from one to another, after having received it from him. They may exchange it, as we may say, among themselves, but they cannot produce it: he only extracts from himself that precious substance, and emits it with vigour on all sides: where ever it meets with any thing that is solid, it reflects, and from one Planet to another long and vast trains of Light cross and traverse one another in a thousand ways, and form an admirable Tissue of the richest material in the World. The Sun likewise is seated in the Center, as a place the most convenient, from whence he may equally distribute his Heat and animate all things with it. The Sun then is a particular body, but what sort of body, is hard to say. It was ever believ'd to be a most refined fire, but that opinion vanish'd in the beginning of this Age, when the Spots upon his surface were discover'd. When the new Planets, whereof I shall tell you more, were discover'd not long before, and all the Philosophick World busied their Brains about nothing else, it was presently judg'd that those Spots were the new Planets, that they had a motion about the Sun, and that necessarily they hid some part of him from

us, in turning their obscure half toward us. Presently the *Virtuoso's* began their Flattery with these pretended Planets to all the Princes of *Europe*, some gave them the name of one Prince, some of another, and perhaps there was a quarrel among them what Prince should be Godfather to the chief of those Spots.

I do not approve of that, said the *Marchioness*, you told me the other day, that the different parts of the *Moon* were call'd by the names of *Virtuoso's* and *Astronomers*, and I was well satisfy'd. For since Princes have the Earth to themselves, it is but just the *Virtuoso's* should reserve the Heavens to themselves, and govern there without admitting any Rivals. You may allow them, said I, in case of necessity, to ingage a Star or part of the *Moon* to a Prince; as for the Spots of the *Sun*, they can make no use of them. It has been found that they are not Planets, but Clouds, or Fumes, or Froth that rises upon the Face of the *Sun*: sometimes they are many, sometimes few, sometimes they wholly disappear, sometimes many of them crowd together, sometimes they separate, sometimes they appear more clear and sometimes more obscure, sometimes many of them are seen; and at other times for a long while together none appear at all. The *Sun* seems to be some liquid matter, some think melted Gold that boyls incessantly, and produces those impurities, which by the force of his motion are thrown out upon his surface, where they consume, and he afterward produces more. Imagine with your self what strange bodies those are, some of them are, it may be, as big as the Earth, judge from thence how great is the quantity of that melted Gold, and how large that Sea of Light and Fire which we call the *Sun*. Others say that the *Sun* appears in the Telescope full of Mountains that vomit Flame, and it seems

seems a million of *Aëna's* put together, but they say likewise that those mountains are a meer appearance, caus'd by some accident in the Telescope. But what then shall we trust to, if we must distrust the Telescope, to which we owe the knowledge of so many new Objects? In fine, whatever the *Sun* be, it appears not at all fit to be inhabited, which certainly is a great loss; for it would be a delicate Habitation: We should be in the Center of all, and should see the Planets move regularly about him, whereas now we see an infinite extravagance in their motions, because we are not in a place proper to judge of them, that is in the Center, is not that a pity? There is but one place in the World where the study of the Stars would be extreme easie, and in that very place there's not a man. You never consider, said the Marchioness, that whoever should be in the *Sun* would see nothing at all, neither Planets nor fixed Stars. Does not the *Sun* hide all? So it would be with his Inhabitants, who would indeed have good reason to believe themselves the only Creatures in Nature.

I confess, said I. I was mistaken, I only consider'd the Scituation of the *Sun*, and not the effect of his Light; but you that correct me so aptly, must give me leave to tell you, that you are as much mistaken as my self, the Inhabitants of the *Sun* would not see him at all. Either they would not be able to suffer the force of his Light, or they could not receive it being not plac'd at a distance from it; all which being well consider'd, the *Sun* would be only an abode of Blind people: But to prevent all that, it is not made to be inhabited. Will you then that we prosecute our Voyage about the Worlds? We are come to the Center, which is always the lowest place in any thing that is round, we must now return and ascend again, and shall meet in our way *Mercury*,
Venus.

Venus, the *Earth* and the *Moon*, Planets that we have already visited. The next that offers is *Mars*, who has nothing curious in him, that I know, his days are not a whole hour longer than ours, but his years are as long as two of ours: he is less than the *Earth*, and sees the *Sun* neither so big nor so bright as we. In fine, *Mars* has nothing in him worth the while to detain us. But the jolly *Jupiter* with his four *Moons* or *Satellites* is worth a Visit. They are four little Planets that turn about him as the *Moon* turns about us. But, says the Marchioness, interrupting me, why! are there Planets that turn about other Planets no better than themselves? Seriously it would seem to me more regular and uniform that all Planets both great and small should have but one and the same motion about the *Sun*.

Ah! Madam, said I, did you but know what the *Vortices* of *Descartes* are, *Vortices* whose name is so terrible and Idea so agreeable, you would not talk as you do. What, says she laughing, must my Head turn round? 'twill be pleasant to know what these *Vortices* are; pray make an end of fooling me, I can no longer govern my self, nor muse longer upon Philosophy, let us leave talking of the World, and begin with these *Vortices*. I never knew you so transported, said I, 'tis pity there is any other Objects than *Vortices*. A *Vortex* is a mass of matter whose parts are lose one from the other, and move all in conformity to themselves; but in the mean time you must allow them some little particular motions, provided they still follow the general motion. So a Whirlwind is an infinity of little parts of Air, that turn round altogether and inclose all they meet. You know the Planets are carried in the celestial matter, which is of a prodigious subtilty and agitation. All that great mass of celestial matter from the *Sun* to the fixed Stars turns round and carrying the Planets with it, makes them

them turn all uniformly about the *Sun*, which possesses the Center, but in more or less time, according as their distances are more or less from him. All even to the *Sun* it self turn. but he turns only about himself, because he is just in the Center of that celestial matter, and you must observe by the way, that were the Earth in the Center it could do no less than turn upon its own Axis.

You see there what is the great *Vortex* whereof the *Sun* is Master, but at the same time the Planets make little particular *Vortices* in imitation of that of the *Sun*. Each of them in turning about the *Sun*, turns likewise about it self, and turns together with it a certain quantity of the celestial matter, which is apt to comply with any motion that is given it, if they do not divert it from its general motion. This is the particular *Vortex* of a Planet, and the Planet pushes it forward as far as the force of its motion can extend. If in that little *Vortex* a Planet less than that which rules there, do incroach, it is carried on by the greater, and forc'd indispenibly to turn about it: yet nevertheless the great and little Planet, and the *Vortex* that incloses them, turn about the *Sun*. So at the beginning of the World, we made the *Moon* follow us, because she was plac'd within the limits and extent of our *Vortex*, and wholly at our devotion. *Jupiter*, of whom I began to tell you, was more happy or more powerful than we, there were four little Planets in his Neighbourhood, and he subdu'd them all; don't you think he would have subdu'd us likewise, who are a principal Planet, had we been his Neighbours? He is ninety times bigger than us, and would doubtless with ease have swallow'd us up in his *Vortex*, and we should have been no more than a *Moon* attending on him: whereas we now have one of our own attending on us, So true it is, that the chance only of place and situation often decides the whole fortune of a man.

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And what assurance, said the Marchioness, have we of continuing always where we are? I begin to fear we may commit the folly of approaching too near so bold a Planet as *Jupiter*, or that he may draw toward us to swallow us up; for it seems to me that that great motion of the celestial matter ought to move the Planets irregularly, and draw them sometime nearer, sometime further off from one another. We should as soon gain as lose by that, said I, perhaps we should bring *Mercury* and *Venus*, little Planets which could not resist us, into subjection to us. But we need neither hope nor fear, the Planets still keep their old stations and are forbidden to make new Conquests, as heretofore the Kings of *China* were. You know that in mixing Oil & Water, the Oil swims above, and if you lay upon those two liquors a body extremely light, the Oil will support it that it shall not touch the Water; but if you add another body more heavy of a certain weight, it will pass through the Oil which will be too weak to support it, and will press till it meets the Water, which will be strong enough to bear it. So in that liquor compos'd of two liquors that do not intermix, two bodies of unequal weight do naturally put themselves in two different places, and the one will never ascend, nor the other descend. Again, put together other liquors that shall continue separate and unmixed, and put in other bodies, it will be still the same. Represent to your self that the celestial matter that fills this great *Vortex* has several lays that infold one another, and whereof the Weights are different, as those of Oil and Water, and other liquors. The Planets have likewise different Weights, and consequently every one of them floats upon the lay, which has exactly a strength necessary to support it, and makes it of such equal poise, that it is not possible it should ever remove from thence.

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I understand very well. said the Marchioness, that those weights do well regulate those lays, I wish to God we had some such Regulation among us, that might fix people in the places that are naturally fit for them. You see me now well satisfy'd as to *Jupiter*, and very well pleas'd that he will let us alone in our little *Vortex* with our one only *Moon*; for I am of a humour that easily confine my self, and do not envy him his four.

You would do him wrong to envy him, says I, he has no more than he has need of, at the distance he is from the *Sun* his *Moons* receive and reflect upon him a very weak Light. 'Tis true that he turning about himself in ten hours, his nights, which continue but five, are very short, and it may seem that he has no necessity of four *Moons*; but there are other things to be consider'd, here under the Poles we have six months day and six night; for the Poles are the two extremities of the Earth farthest distant from those places through which the *Sun* seems to make his course. The *Moon* holds or seems to hold the same course very near that the *Sun* doth, and as the Inhabitants of the Poles see the *Sun* for one half of his annual course, and the other half see him not at all; so they likewise see the *Moon* during one half of her monthly course, that is, for fifteen days, and see her not the other fifteen. The years of *Jupiter* are twelve of ours, and there ought to be in that Planet two opposite extremities, where the days & nights are of six years continuance: Nights of six years are very long, therefore I believe it was for their sakes that those four *Moons* were design'd. That which in respect of *Jupiter* is the highest, makes its course round him in seventeen days, the second in seven, the third in three days and a half, and the fourth in forty two hours; their courses being cut just in half for the unhappy people of that Country, who have six years night,
they

they cannot pass one and twenty hours, without seeing at least the last of those *Moons*. 'Tis a Consolation during a Darkness of so tedious a continuance: but in whatever place of *Jupiter* you inhabit, those four *Moons* will give you the most pleasant Spectacle in the World. Sometimes they rise all at once, and then separate themselves according to the inequality of their motions, sometimes they are all in their Meridian rang'd the one above the other, sometimes they appear all four above the Horizon at equal distances, sometimes when two of them rise, the other two set; but above all, I should delight to see their Eclipses, for there's not a day passes but they eclipse one another or eclipse the *Sun*, and certainly Eclipses being so familiar in that World, they are a great subject of Divertisement, and not of Fear as they are here.

And you will not fail, said the Marchioness, to people those four *Moons* likewise, though they are but little subalternate Planets, design'd only to enlighten the nights of another. No doubt on't, said I, those Planets are not at all less worthy to be inhabited for being subjected to turn about another more important. I would then, says she, have it, that the Inhabitants of the four *Moons* of *Jupiter*, should be Colonies drawn from him, and that they should receive from him, if possible, their Laws and Customs, and consequently should render him some sort of Homage, and never look upon the great Planet without Respect. And must it not be likewise, said I, that the four *Moons* should from time to time send their Deputies to *Jupiter*, to make their Oath of Fidelity? for my part, I assure you that the little Superiority we have over the people of our *Moon*, makes me doubt whether *Jupiter* has much over the Inhabitants of his, and I believe the advantage he can most reasonably pretend to, is to frighten them; for example, in that which is nearest to him, he appears to
them

them three hundred and sixty times bigger than our *Moon* appears to us; for he is so much bigger than she is: he is, I believe, nearer to them than she is to us, which still increases the bigness. They have then that monstrous Planet daily hanging over their heads at a very little distance, and truly if the *Gauls* of old were afraid the Heavens would fall upon them, the Inhabitants of that *Moon* have much more cause to fear the fall of *Jupiter*. That is, possibly, says she, the fear they have instead of that of Eclipses, which you tell me they are free from, but must pay for it by some other folly. That is of absolute necessity, said I; the Inventor of the third System, whom I told you of the other day, the famous *Tycho Brahe*, the greatest Astronomer that ever was, he fear'd not Eclipses as the vulgar do; for his daily Conversation was with them; but would you believe what he fear'd instead of them? When he went at any time out of his Lodging, if the first person he met were an old Woman, or if a Hare cross'd his way, he believ'd it would be an unlucky day to him, and would presently return and shut himself up, and not dare to take in hand the least matter.

It would not be just, said she, since that Man could not deliver himself from the fear of Eclipses, without paying for it by some folly, that the Inhabitants of that *Moon* of *Jupiter*, which we speak of, should free themselves with less trouble, we'll give them no Quarter, they shall undergo the Common Law, and fall into some other Errour, but how, I trouble not my head to guess. Therefore pray explain to me another difficulty has possess'd me within this little while, if the Earth be so little in respect of *Jupiter*, doth *Jupiter* see us? I fear we are unknown to him.

Truly, says I, I believe that, he must needs see the Earth ninety times less than we see him, that's too little, he sees it not all: But here's that which we
may

may better believe for our advantage, there may be Astronomers in *Jupiter*, who having taken pains to make excellent Telescopes, and choosing the fairest nights for Observation, may at last have discover'd in the Heavens a little Planet which they never saw before, presently the *Journal des sçavans* of that Country speaks of it; the people of *Jupiter* either hear nothing of it, or only laugh at it. The Philosophers, whose Opinions it destroys, are resolved not to believe it; none but the most reasonable doubt of it. Observations are repeated, and the little Planet is reviewed; people are certain that 'tis no Vision, and begin to suspect that it moves about the *Sun*, after a thousand Observations 'tis discover'd that that motion is annual, and at last, thanks to the pains and studies of the *Virtuoso's*, 'tis known in *Jupiter* that our Earth is a World, the curious run to gaze on it with their Telescopes, and scarcely is it discernable.

If it were not, said the Marchioness, that it is not very satisfactory to know that from *Jupiter* they cannot discover us without a Telescope, I should take pleasure in representing to my self those Telescopes of *Jupiter* planted toward us as ours are to behold him, and that mutual curiosity of the two Planets in considering one another, and asking *what World is this? what People inhabit here?*

Hold, said I, that's not so soon done as you imagine: should the Inhabitants of *Jupiter* see our *Earth*, and know it, yet our *Earth* is not our selves; there would not be the least suspicion that 'tis inhabited: and should any one chance to entertain such a thought, God knows how the whole World of *Jupiter* would mock him. Nay possibly we have already been the cause of arraigining some of their Philosophers for holding that we have a Being in Nature. In the mean time I rather believe, that the
Inhabi-

Inhabitants of *Jupiter* have employment enough in making discoveries in their own Planet, without ever dreaming of us; it is so big, that if they have the Art of Navigation, their *Christopher Columba's* have most certainly employment enough. It must needs be that the people of that World do not know the hundredth part of it; whereas in *Mercury*, which is very little, they are all Neighbours, live very familiarly together, and count it but a Walk, to make a turn about their World. If they do not see us from *Jupiter*, you will easily judge that the people of that Planet do much less see *Venus* and *Mercury*, which are both lesser Worlds, and more distant from him. But to make amends, his inhabitants see *Mars*, and their own four *Moons*, and *Saturn* with his. These are Planets enough to perplex their Astronomers, and Nature has been so kind to conceal the rest of the Universe from them.

How, said the Marchioness, do you count that a kindness? Without doubt it is, said I, there are in all this great *Vortex* sixteen Planets. Nature, who would save us the trouble of studying all their motions, has let us see but seven of them, is not that a great kindness? But we, who know not how to value it, have taken a course to find out the other nine that were conceal'd, and are punish'd for our pains by the great labour that Astronomy at present requires.

I find, says she, by that number of sixteen Planets, that *Saturn* ought to have five *Moons*. He has so, says I, and of those five, two are but lately discovered; but there is a thing yet much more remarkable, one of his years being thirty of ours, and by consequence there being Countreys in him, whose night is of fifteen years continuance, guess you what Nature has invented to enlighten such terrible nights.

She was not satisfy'd with bestowing five *Moons* upon *Saturn*, but she has also inclos'd him with a great Circle or Ring, which is high enough rais'd to be out of the Shadow of the Body of that Planet, and continually reflects the Light of the Sun upon those places that do not see him.

Seriously and truly, says the Marchioness, with an Air of one astonish'd, all this is a work of great Order, it is very visible that Nature had in her eye the Necessities of every living Being, and that the Distribution of *Moons* was not a thing done at random. There's none share in it but the Planets farthest distant from the *Sun*, viz. the *Earth*, *Jupiter* and *Saturn*; for it was not worth the while to give them to *Venus* and *Mercury*, who receive but too much Light, whose Nights are short, and which they esteem a much greater benefit of Nature than their Days.

But stay, says she, methinks *Mars*, who is farther remov'd from the *Sun* than the *Earth* is, has no *Moon*. It cannot be deny'd, said I, he has none, and therefore he must have some other refuge in his nights than we know of. You have seen those *Phosphores*, of either dry or liquid matter, which receiving the Light of the *Sun*, imbibe it, and diffusing it in the dark, give a considerable light. Perhaps *Mars* has great Rocks high rais'd, which are natural *Phosphores*, and which in the day time make a provision of Light, which they disburse in the night. You cannot deny that it would be a delightful spectacle to see all those Rocks lighted at Sunset, and make magnificent Illuminations without any Art. You know likewise that there are in *America* certain Birds so luminous, that they give light enough to read by in the dark. How do we know but *Mars* has a great many of those Birds, which at nightfall disperse themselves every where, and create a new day?

I am

I am not satisfy'd, says she, neither with your Rocks nor your Birds; not but that it may be very pretty; but since Nature has given so many *Moons* to *Saturn* and *Jupiter*, 'tis a sign there is occasion for them. I should have been glad that all the Worlds far distant from the *Sun* had them likewise, but *Mars* I find makes a disagreeable exception. Ah! says I, if you look'd more into Philosophy than you do, you would accustom your self to find exceptions in the best Systems. There is ever something that agrees very well, and something that we make agree as well as we can, or else we let it alone, if we despair of succeeding well in it. Let us deal so with *Mars*: since he doth not favour us, let us e'en say no more of him. We should be sufficiently astonished if we were in *Saturn*, to see over our heads in the night that great Ring, which moving in form of a Semicircle from one end of the Horizon to the other, reflects the Light of the *Sun*, and performs the office of a perpetual *Moon*. And, says the Marchioness, laughing, must we not likewise have Inhabitants in that great Ring? Truly said I, however I may be bold enough to plant them every where else, I must confess, I dare not place any there, that Ring seems an habitation too irregular. But as for the five little *Moons*, I think we cannot well dispense with peopling them; if in the mean time that Ring be, as some suspect, no more than a circle of *Moons* that follow one another very close with an equal motion, and that the five little *Moons* are such as have made their escape from the great Circle, what an infinity of Worlds shall we have in that *Vortex* of *Saturn*? however it be, the people of *Saturn*, with all the help of that Ring, are miserable enough. It gives them light, but what sort of a light at that distance from the *Sun*? the *Sun* it self is to them but a small Star, pale and wan, and has on-

ly a little glittering and a feeble heat. Were they brought into the coldest of our Countrys, as *Grænländ* or *Lapland*, you would see them melt and expire with heat. You give me, says the Marchioness, an Idea of *Saturn* that freezes me, as just now you heated me in your discourse of *Mercury*. It must needs be, says I, that two Worlds that are in the extremities of this great Vortex, should be opposite in all things.

So then, says she, they must be wise in *Saturn*; for you told me, they are all fools in *Mercury*. If they are not wise in *Saturn*, said I, they are, at least in all appearance 'very flegmatick: they are people that know not what it is to laugh, that require a whole day to answer to the least Question, and would look upon *Cato of Vitica* as a Buffoon or a Jack-pudding. I have a thought in my head, says she; all the Inhabitants of *Mercury* are lively, and all those of *Saturn* are dull; among us some are lively and some are dull, doth not this proceed from hence, that we being just in the middle between those other Worlds, participate of the extremities? There is no fixed and determinate Character for Man, some are fram'd like the Inhabitants of *Mercury*, others like those of *Saturn*, and we are a mixture of all species that are in the other Planets. I like that Idea, said I, well enough, we make up so odd a kind of likeness, that it may be thought we are a Collection out of several different Worlds; and therefore 'tis convenient enough to be here, where we see all the other Worlds in *compendium*.

At least, said the Marchioness, our World has one real convenience by 'the Scituation, that it is neither so hot as *Mercury* or *Venus*, nor so cold as *Jupiter* or *Saturn*; and moreover we are seated just in a part of the Earth where we find excess neither of Heat nor Cold. Seriously, if a certain Philosopher gave thanks
to

to Nature for making him a Man and not a Beast, a Greek and not a *Barbarian*, I for my share give her thanks for placing me in the most temperate Planet of the Universe, and in the most temperate place of that Planet. Believe me, Madam, said I, you may give her thanks that you are young and not old, young and fair, and not young and ugly; a young and fair French-woman, and not a young and fair *Italian*: these are things to be acknowledg'd as advantages as well as those you receive by the Scituation of your *Vortex* and the Temperature of your Country.

Good God! said the Marchioness, let me acknowledg all, even to the *Vortex* where I am plac'd, the proportion of Happiness that has been measur'd out to us is very small, and we ought to be chary of it and lose none, and it is good to entertain such a relish and sense of even the most common and inconsiderable things, as may render them useful to us. If we desire only lively pleasures, we shall have few, stay long and pay dear for them. You will promise me then, said I, if I propose lively pleasures to you, you will remember me and my *Vortices*, and will be of our side. I will, said she, but you must provide that Philosophy still supply me with new pleasures. At least, said I, to morrow, I hope, you shall not fail of them. I have fixed Stars that will go beyond all that you have seen yet.

T H E

Fifth Evening.

THe Marchioness was sensibly impatient to know what would become of the fixed Stars. Shall they be inhabited, says she, as the Planets are, or shall they not? or what shall we do with them? Perhaps, said I, you might guess, if you would; the fixed Stars cannot be less distant from the Earth than some fifty millions of Leagues, and if you vex an Astronomer, he'll put them a great way further. The distance of the *Sun* from the most distant Planet, is nothing in comparison of the distance of the *Sun* or of the *Earth* from the fixed Stars, men do not take the pains to compute it. Their Light, as you see, is bright and lively enough. If they receive it from the *Sun*, they must needs receive it in a weak condition after a passage of fifty millions of Leagues, and they must return it to us through the same distance by a Reflection, that must yet much more impair the strength of it. It may seem impossible that a Light that is made by Reflection, and has travail'd twice fifty millions of Leagues, should retain that force and vivacity which we find in the fixed Stars. You see then they are all luminous in themselves, and in a word, are so many *Suns*.

I am not out of the way, cry'd the Marchioness, whether I go, or whether you lead me, you are going

going to tell me, That the fixed Stars are so many Suns, our Sun is the Center of a Vortex that turns about him, why should not every fixed Star be the Center of a Vortex that has likewise a motion about it? Our Sun has Planets which it enlightens, why should not every fixed Star have the like? I have no Answer, said I, but that of Phedra to Enone, 'Tis you have said it.

But, says she, why there's the Universe so big that I am lost in it, I know not where I am, I'm nothing. What, shall all be divided into Vortices confusedly thrown one among another? Shall every Star be the Center of a Vortex as big perhaps as that wherein we are? Shall all the immense space that comprehends our Sun and our Planets be no more than a little Spot of the Universe? This confounds, perplexes and astonishes me. And, said I, for my share, I am wholly at ease. Were Heaven no more than that blue Vault where the Stars are nail'd, the Universe would seem small and narrow to me, and I should find my self straighten'd and oppress'd. But now that this Vault is of infinite more extent and profundity, in dividing it into a thousand thousand Vortices, methinks I breath with more liberty, and am in a more open Air; and most assuredly the Universe has wholly another Magnificence. Nature spar'd nothing in making it, but made a profusion of her Riches wholly worthy of her. Nothing can be represented so beautiful as that prodigious number of Vortices in the Center whereof is seated the Sun turning the Planets about him. The Inhabitants of a Planet of one of those infinite Vortices, see on all sides the luminous centers of those Vortices which surround them, but they see not the Planets, which having but a feeble light borrowed from their Sun, do

not propagate it beyond their World.

You offer me, said she, a kind of Perspective so long, that my eye cannot reach the end of it. I clearly see the Inhabitants of the Earth, and afterward you shew me those of the *Moon* and the other Planets of our *Vortex*, truly clearly enough, but less than those of the *Earth*, and after them come the Inhabitants of the Planets of other *Vortices*. I protest to you they are wholly drown'd, and with all that I can do to see them, they are still almost wholly indiscernable. And in effect, are they not almost annihilated by the expression you are fain to make use of in speaking of them, you are fain to call them *the Inhabitants of one of the Planets of one of those infinite Vortices*. You must confess that you hardly know how to disengage us our selves, to whom the same expression agrees, from the midst of so many Worlds. For my share, I begin to see the Earth so fearfully little, that from hence forward I shall have no value for any thing in it. Certainly men are so earnest in the pursuit of Greatness, form Design upon Design, and turmoile themselves so much, only because they are ignorant of these Vortices. These new Lights I intend shall apologize for me; and when any blame me for an unactive negligence, my Answer shall be, *Ab! if you did but know what the fixed Stars are!* Alexander, says I, certainly knew nothing of them; for a certain Author, who holds that the *Moon* is inhabited, says seriously, that it was not possible that *Aristotle* should not be of an opinion so reasonable (for how could a Truth escape *Aristotle*?) but that he would say nothing of it for fear of displeasing *Alexander*, who would have fallen into despair to have seen a World that he could not conquer. The truth is, should any one have
made

made a Mystery of the Vortices and fixed Stars, had they been known in those days, it had been an ill Complement to have told him of them. I my self, that know them, am not a little concern'd that I can make no profit by the Knowledge. They at best, in your opinion, cure only an unquiet and ambitious mind, which I am not troubl'd with; a little foolish inclination for the thing that's fair, is all my malady, and I doubt the Vortices can do me little kindness in that. The other Worlds, you say, make this seem little to you, but yet they obscure not the Lustre of your Eyes, nor spoil that pretty Mouth, those have still the same value in spite of all the Worlds.

This Love, said the Marchioness, laughing, is a strange thing, it has a Salvo for all things and there's no System can do it harm. But tell me pray, and tell me freely, is your System true? Hide nothing from me, I promise you secrecy. To me it seems grounded only on a little Conveniency superficial enough. A Star fixed and luminous in it self like the *Sun*, ought consequently to be as the Sun is, the Center and Soul of a World, and to have Planets turning about him. Is not this of absolute necessity?

Hark you, Madam, said I, since 'tis our humour to mix the Folly of Gallantry with our most serious Discourse, the Reasonings of Mathematicks are like those of Love; grant but a Lover the least thing, and you are presently ingag'd to make a farther Concession, and then another, and so to the Worlds end. In like manner grant a Mathematician the least Principle, he'll deduce a Consequence that you must likewise grant, and from that another, and whether you will or not he'll carry you so far as you hardly believe. These two sort of people

people take more than is given them. You allow, that when two things are alike in what appears to me, I may believe they are also alike in what appears not to me, if nothing otherways hinders me. From hence I concluded that the *Moon* is inhabited, because she resembles the Earth, and that the Planets are, because they resemble *Moon*. I find that the fixed Stars resemble our *Sun*, and I attribute to them all that is in him. You are now too far ingag'd to retire, you must e'en go on. But, says she, according to this Resemblance you make between the fixed Stars and our *Sun*, it must needs be that the people of another great Vortex do not see him but as a little fixed Star, which appears to them only in their night.

No doubt on't, said I, our *Sun* is so near us, in comparison of the *Suns* of other Vortices, that his Light must have infinitely more of force upon our Eyes than theirs: so that we see him, and him only, when we see him; for he dazles all else. But in another great Vortex, another *Sun* prevails, and he takes his turn and dazles ours, which appears there only in the night with the other forreign *Suns*, that is, the fixed Stars. The people there seat him with them in the great Arch of Heaven, and there he makes a part perhaps of some *Bull* or *Bear*. As for the Planets that move about him, as our *Earth*, for example, they are not discerned so far off, and no body dreams of them. So all the *Suns* are *Day Suns* for the Vortices where they are placed, and *Night Suns* for all the other Vortices. In their World they are the only ones of their kind, every where else they serve only to make up the number of Stars.

But yet, says she, notwithstanding this Equality, may not these Worlds differ in a thousand things?
for

for a Resemblance in the main may admit of infinite varieties.

Most certain, said I, but the difficulty is to guess what or how. What know I? one Vortex has more Planets that turn about his Sun, another has fewer. In the one there are subordinate Planets, which move about others that are bigger, in another ther's no such thing. Here they all crowd together about their *Sun*, and make, as it were, a little Ball, beyond which a great void space extends as far as the neighbouring Vortices. In another place they take their course toward the extremities of the Vortex, and leave the middle void. I doubt not likewise but there may be some Vortices desert, and without Planets; and others, whose *Sun* not being exactly in the Center, has a true motion, and carries his Planets with him. Others that rise or fall in respect of their *Sun*, according to the change of the poise that sustains them. In fine, what more would you have? There's e'en enough for a man that was never out of his own Vortex.

That's not much, says she, for the Quantity of Worlds; what you say is not enough for above five or six, and I see here a million.

What would it be then, said I, if I should tell you that there are many more fixed Stars than those that you see, and that with a Telescope an infinite number are discover'd that did not appear to the eye, and that in one sole Constellation, where we usually reckon perhaps twelve, or fifteen, there are found to be as many as were seen before in the whole Heaven.

Oh! cry'd the Marchioness, give me Quarter, I yield, you overwhelm me with Worlds and Vortices.

I know, said I, what I have in store for you
yet

yet. You see that *White*, commonly call'd the *Milky way*. Can you imagine what it is? 'Tis an infinity of little Stars invisible to the eye, because of their smallness, and so thick set one by the other that they seem to form that continued Whiteness. I wish you saw with a Telescope that crowd of Stars, like Ants in their Hillock, that Grainery of Worlds (if I may be permitted the expression) they resemble in some sort the *Maldivian* Isles, those twelve thousand little Isles or Banks of Sand, separated only by little Channels of the Sea, that a man may leap over as easie as so many Ditches. So the little *Vortices* of the *Milky way* are so close one to the other, that methinks from one World to the other they may hold discourse, and even shake hands; at least, I believe, the Birds of one World pass easily to another; and Pigeons that are taught to carry Letters, may be as useful there as here in the *Levant*.

Those little Worlds are evidently an exception from the general Rule by which one *Sun*. when he appears in his *Vortex*, extinguishes all forreign *Suns*. If you are in one of those little *Vortices* of the *Milky way*, your *Sun* is hardly nearer to you, and consequently has not sensibly more of force upon your Eyes than an hundred thousand other *Suns* of the neighbouring *Vortices*. You see then your Heaven glittering with an infinite number of Fires, very near one to the other, and not far distant from you. When you have lost sight of your *Sun*, you have still enough remain, and your Night is as clear as the Day, or at least the difference is not sensible, and to speak better, you have no Night at all. The people of those Worlds, us'd as they are to a perpetual Light, would be much astonish'd to hear that there are unhappy people

people that have real Nights, that are bury'd in profound Darkness, and when they enjoy the Light, 'tis only of one *Sun*: They would look on us as Beings curs'd by Nature, and would tremble with Horror at our Condition.

I do not ask you, said the Marchioness, if there be *Moons* in those Worlds in the *Milky way*. I well see they would be of no use to the principal Planets, that have no Night, and which moreover move in spaces too straight to incumber themselves with that attendance of subordinate Planets. But do you know, that your profuse multiplying of Worlds upon me, has rais'd in me a real difficulty? The *Vortices*, where we see the *Suns*, touch the *Vortex* where we are. The *Vortices* are round, are they not? How then can so many Bowls touch one? I would imagine this, but I am sensible I cannot.

There's a great deal of Wit and Judgment, said I, in having that difficulty, and likewise in not being able to resolve it. For it is good in it self, and in the manner you conceive it, 'tis unanswerable, and there's but little Wit in finding an Answer for what has none. If our *Vortex* were of the figure of a Dy, it would have six flat faces, and would be very far from being round, but upon every one of those faces might be put a *Vortex* of the same figure; if instead of six flat faces, it had 20, 50, 1000, there might be 1000 *Vortices* laid on it, every one on a particular face, and you apprehend that the more flat faces a body has, the nearer it comes to a round figure, so as a Diamond cut into flats, if the flats be very small, will be almost as round as a Pearl of the same bigness. The *Vortices* are not round, but after that manner; they have an infinity of flats on their outside,
each

each of which carries another *Vortex*. These flats are very unequal, some great, some small. The lesser of our *Vortex*, for example, correspond with the *Milky way*, and sustain all those little Worlds: and whereas two *Vortices* that rest upon two adjoining flats, leave a void space between them underneath. Nature, in that case, who knows well how to manage the matter, fills up those void spaces with a little *Vortex* or two, perhaps with a thousand, which do not at all disturb the rest, and are only an addition of one or two or a thousand Worlds more; so that we may see many more Worlds than our *Vortex* has flats to carry. I'll hold a wager that though those little Worlds were only made to be thrown into a corner of the Universe, what would otherwise have remain'd useless, although they are unknown to the other Worlds that touch them, they are yet well content in themselves. They are doubtless those whose *Suns* are not to be seen without the Telescope, and which are prodigious in number. In fine, all these *Vortices* agree one with another the best they can: and whereas each of them must turn about his *Sun* without changing place, every one takes the way of turning that is most convenient and easie in his situation. They ingrain one within another like the Wheels of a Watch, and mutually help each others motion. Yet 'tis true, they likewise act one against another. Every World, 'tis said, is like a Bladder that swells it self, and would extend it self, if it were let alone; but it is repress'd by the neighbouring Worlds, and contracts it self, and then swells again, and so on. And 'tis thought that the fixed Stars give us a trembling Light, and seem to twinkle only, because their *Vortices* perpetually press upon ours, and are pressed by it.

I have a great kindness, said the Marchioness, for these Idea's, I love these Bladders that swell and fall again every moment, and these Worlds that combat one another, and above all, I am pleas'd to see that the Combate produces an intercourse of Light between them, which is certainly the only Commerce they can have.

No, no, said I, that's not the only Correspondence; the neighbouring Worlds send sometimes to visit us, and that with Magnificence enough: there come Comets to us from thence, which are ever adorn'd, either with a bright shining Perriwig, or a venerable Beard, or a Majestick Tail.

Ah! says she, laughing, what kind of Embassadours are those? We might well excuse their Visit, for they serve only to scare people.

They scare none but Children, said I, because of their extraordinary Equipage, but those Children indeed are many. Comets are only Planets that belong to a neighbouring Vortex. They had their motion toward the extremities, but that Vortex being perhaps differently press'd by those that are round about it, is more round above and flatter below, and 'tis the part below that looks toward us. Those Planets that began their circular motion above, did not foresee that *below* the Vortex fail'd them; because it is there as it were press'd flat, and to continue their circular motion, they of necessity incroach upon another Vortex, which I suppose to be ours, and cut the extremities of it. They are ever very high, in respect of us, and move far above *Saturn*. It is necessary in our System, for reasons that are nothing to our present subject that from *Saturn* to the two extremities of our Vortex, there should be a great void space and without Planets. Our enemies still charge

charge us with the unusefulness of that space; but let them not trouble their Heads, we have found the use of it; tis the Appartment of foreign Planets that come to our World.

I understand you well, said she, we suffer them not to enter into the heart of our *Vortex*, and with our own Planets; but we receive them as the Grand Seignior receives Embassadors; He doth not honour them with Lodgings in *Constantinople*, but only in the Suburbs of the Town.

We have this likewise, said I, in common with the *Ottomans*, that as they receive Embassadors, but send none; so we send none of our Planets to the neighbouring Worlds.

To speak my Opinion, said she, upon the whole matter, we are very rude: in the mean time I know not well what I ought to believe. These foreign Planets have a very menacing Air with their Tails and Beards, and perhaps they are sent to insult us; whereas ours, that are not made after the same manner, are not so proper to cause Fear, should they be sent into other Worlds.

Those Tails and Beards, said I, are meer Appearances, those foreign Planets differ nothing from ours, but at their entrance into our *Vortex*, they take the Tail and Beard by a certain strong Illumination of the *Sun*, which has not yet been well explained between us; but yet we are sure it acts only by a kind of Illumination; we'll judge more certainly of it when we can.

I should be very willing then, said she, that *Saturn* would take a Tail or a Beard in some other *Vortex*, and spread a Fear there, and having laid aside his terrible Equipage, return and range himself with the other Planets in his ordinary Function.

'Tis

'Tis better, said I, for him, that he should not stir at all out of our *Vortex*; I have told you what a shock two *Vortices* make when they push against one another, I believe the poor Planet is then handled rudely enough, and the Inhabitants are not much more at ease. We believe we are unhappy when a Comet appears, whereas 'tis the Comet it self that is unhappy.

I do not believe so, said the Marchioness, it brings us all its Inhabitants in good health. Nothing is so diverting as that change of *Vortex*; We who never stir out of ours, lead a life uneasy enough. If the Inhabitants of a Comet have wit enough to foresee the time of their passage into our World, those who have already made the Voyage, discover to the others beforehand, what they shall see there. You will presently see a Planet with a great Ring about it, say they, perhaps speaking of *Saturn*, you will see another that has four little ones following it: perhaps likewise there are people appointed to observe the very moment of their entrance into our World, who cry *A new Sun, a new Sun*, as the Seamen cry *Land, land*.

I need not then, continued I, think any more of persuading you to pity the Inhabitants of a Comet, but I hope, at least, you will compassionate those that live in a *Vortex* where the *Sun* is extinct. How! cry'd she, Suns extinct? Yes, doubtless, said I, the Ancients saw fixed Stars in the Heavens which we do not see now, those *Suns* have lost their Light. A great desolation most certainly in the whole *Vortex*, a general mortality among all the Planets for what's to be done without a *Sun*? That Idea, said she, is too sad, can you no way excuse me that? I'll tell you, if you please,

luminous, and as they turn upon their own Axis they sometimes present us the luminous side, and then we see them, sometimes the obscure side, and then we see them not. I would, to oblige you, hold this Opinion, which is more moderate than the other; but I can hold it only in respect of certain Stars which have regulated times of appearing and disappearing, as is begun to be discover'd in some, otherwise the *Demy Suns* could not subsist. But what shall we say of those Stars that have disappear'd, and were never seen since; though in all this time they might most certainly have perform'd their Course upon their Axis. You are too just to oblige me to believe that they are *Demy Suns*, but yet I'll make another Essay in your favour. Those *Suns* shall not be extinct, they shall be only sunk into the immense profundity of Heaven, beyond the reach of our eye. In such case, the *Vortex* follow'd its *Sun*, and all's well. 'Tis true that the greatest part of the fixed Stars have not that motion, by which they remove themselves from us; for then at other times they ought to return to us, and we should see them sometimes bigger, sometimes less, which doth not happen. But we'll suppose that there are only some little *Vortices* lighter, and more agil, that slip in among the other, and having taken certain turns at the end of their Course they return, while the great *Vortices* remain immovable. But here's the mischief, there are fixed Stars, which come and shew themselves to us, and continue long in only appearing and disappearing, and at last wholly disappear.

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to be visible to our eyes, and they afterward take light again, and at last are wholly extinct. How can a *Sun*; says the Marchioness, obscure and extinguish it self, a *Sun* that is in it self a Source and Spring of Light? The most easily in the world, says I, according to *Des Cartes*. Our *Sun* has Spots, which are Froth, or Scum, or Mists, or what ever you please, those Spots may condense, many of them gather together and close one with another; at last they may go so far as to form a kind of a Crust about the *Sun*, and then farewell *Sun*. We have already fairly escap'd it, they say. The *Sun* has been very pale for some whole years together, as for example, the year after the death of *Cesar*; it was the Crust that began then to grow upon the *Sun*, but by the force of the *Sun* it was dissipated, had it continued we had been undone.

You make me tremble, said the Marchioness, I know now the Consequences of the paleness of the *Sun*, I believe in stead of going to see in my Glass in a morning if I am pale, I shall look toward Heaven, to see if the *Sun* be so.

Ah! Madam, said I, take courage, 'twill require time to ruine a World. But still, says she, time will do it. I confess it, said I, all this immense heap of matter, which makes up the Universe, is in perpetual motion, and no part of it wholly exempt; since then there is a motion in every part, trust it not, there must be a change, be it slow or be it swift, but still in time proportionable to the effect.

charge us with the unusefulness of that space; but let them not trouble their Heads, we have found the use of it; tis the Appartment of foreign Planets that come to our World.

I understand you well, said she, we suffer them not to enter into the heart of our *Vortex*, and with our own Planets; but we receive them as the Grand Seignior receives Embassadors; He doth not honour them with Lodgings in *Constantinople*, but only in the Suburbs of he Town.

We have this likewise, said I, in common with the *Ottomans*, that as they receive Embassadors, but send none; so we send none of our Planets to the neighbouring Worlds.

To speak my Opinion, said she, upon the whole matter, we are very rude: in the mean time I know not well what I ought to believe. These foreign Planets have a very menacing Air with their Tails and Beards, and perhaps they are sent to insult us; whereas ours, that are not made after the same manner, are not so proper to cause Fear, should they be sent into other Worlds.

Those Tails and Beards, said I, are meer Appearances, those foreign Planets differ nothing from ours, but at their entrance into our *Vortex*, they take the Tail and Beard by a certain strong Illumination of the *Sun*, which has not yet been well explained between us; but yet we are sure it acts only by a kind of Illumination; we'll judge more certainly of it when we can.

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A Discourse of the

says I, what knowing men say; That those fixed Stars which have disappear'd, are not therefore extinct, but that they are *Demy Suns*, that is to say, which have the one half obscure and the other luminous; and as they turn upon their own Axis they sometimes present us the luminous side, and then we see them, sometimes the obscure side, and then we see them not. I would, to oblige you, hold this Opinion, which is more moderate than the other; but I can hold it only in respect of certain Stars which have regulated times of appearing and disappearing, as is begun to be discover'd in some, otherwise the *Demy Suns* could not subsist. But what shall we say of those Stars that have disappear'd, and were never seen since; though in all this time they might most certainly have perform'd their Course upon their Axis. You are too just to oblige me to believe that they are *Demy Suns*, but yet I'll make another Essay in your favour. Those *Suns* shall not be extinct, they shall be only sunk into the immense profundity of Heaven, beyond the reach of our eye. In such case, the *Vortex* follow'd its *Sun*, and all's well. 'Tis true that the greatest part of the fixed Stars have not that motion, by which they remove themselves from us; for then at other times they ought to return to us, and we should see them sometimes bigger, sometimes less, which doth not happen. But we'll suppose that there are only some little *Vortices* lighter, and more agil, that slip in among the other, and having taken certain turns at the end of their Course they return, while the great *Vortices* remain immovable. But here's the mischief, there are fixed Stars, which come and shew themselves to us, and continue long in only appearing and disappearing, and at last wholly disappear.

appear. *Demy Suns* would appear again at regular times. *Suns* that sunk into the depth of Heaven would disappear but once for a long time. Now resolve, Madam, courageously, those Stars must be *suns* that obscure themselves enough not to be visible to our eyes, and they afterward take light again, and at last are wholly extinct. How can a *Sun*, says the Marchioness, obscure and extinguish it self, a *Sun* that is in it self a Source and Spring of Light? The most easily in the world, says I, according to *Des Cartes*. Our *Sun* has Spots, which are Froth, or Scum, or Mists, or what ever you please, those Spots may condense, many of them gather together and close one with another; at last they may go so far as to form a kind of a Crust about the *Sun*, and then farewell *Sun*. We have already fairly escap'd it, they say. The *Sun* has been very pale for some whole years together, as for example, the year after the death of *Cesar*; it was the Crust that began then to grow upon the *Sun*, but by the force of the *Sun* it was dissipated, had it continued we had been undone.

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effect. The Ancients had a pleasant fancy that the celestial bodies were unchangeable, because they never saw a change in them; but had they time enough to confirm their Opinion by experience? the Ancients were young in respect of us. Should the Roses, which live but a day, write their own Story, and leave their Memoirs from one to another, the first would make a Description of their Gardiner after one certain fashion, and for more than fifteen thousand Ages of Roses, those that should leave their Story to Posterity would make no alteration; from whence they would reason thus, *We have ever seen the same Gardiner; our History tells us of no other, he was ever made as he is; certainly he dyes not as we do, nor ever changes.* Would this be good Reasoning of the Roses? and yet they would have better ground for it, than the Ancients had for their Opinion of the Celestial bodies. And were it so that the Heavens had suffer'd no change to this day, had they in themselves any Sign or Character of an eternal duration without change, yet I should not believe it, but wait for farther satisfaction from a longer experience. Ought we to establish our Duration, which is but of a moment, by the measures of another? Can we argue that what has continued a hundred thousand times longer than we, will endure for ever? Eternity is not so easily acquir'd. A thing must have out-liv'd many Ages of Man, to begin only to give a sign of its Immortality.

Truly, said the Marchioness, I find the World's very far from any reason of pretending to it; I would not do them the honour so much as to compare them to the Gardiner that survives so many Roses, they are but even as the Roses themselves
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that spring up and perish in the same Garden one after another; for I observe that if some ancient Stars have disappear'd, new ones have succeeded, and still there must be a reparation of the Species.

There is no fear of their perishing, said I; some will tell you they are only *Suns* that return after a long time being lost to us in the profundity of Heaven, others will say, they are *Suns* that have disingag'd themselves from that obscure Crust that began to inclose them. This I easily believe may be, but I believe likewise that the Universe is so made that new *Suns* may be form'd in it from time to time, why may not the matter proper to make a *Sun*, after having been long dispers'd in several places, at last congregate it self in one certain place, and lay the foundations of a new World? I am the rather inclin'd to believe these new productions, because they agree better with those great Ideas I have of the works of Nature. Has not she the secret of causing Herbs and Plants to spring and dye in a continual Revolution? I am persuaded, and you are so likewise, that she practises the same secret in the Worlds, and it costs her no more to do it.

In good Faith, says the Marchioness, I find the Worlds, the Heavens and Celestial bodies so subject to change, that I have e'en left them.

Let us leave them more yet, said I, if you'll be persuaded by me, and talk no more of them; for you are now come to the highest Roof of Heaven, and to tell you whether there be Stars beyond that or not, will require more knowledge than I have. Place Worlds there, or place them not, 'twill depend upon your self. The Empire of Philosophers is properly in those great invilible Countrys, which
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may be or not be, according as they please, and be such as they please to make them. To me it suffices that I have led your thoughts as far as you can reach with your eyes.

So, says she, I have now the whole System of the Universe in my Head; I am now a knowing Woman.

You are, said I, reasonable enough, and you are so with this conveniency, that you may believe nothing of all that I have said to you, till you please your self. I only request, as a Recompence for my pains, that you will never look upon the Sun, Heaven or Stars without thinking on me.

F I N I S.

